



BETTER FRUIT

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Photo by J. E. Mock, Rochester

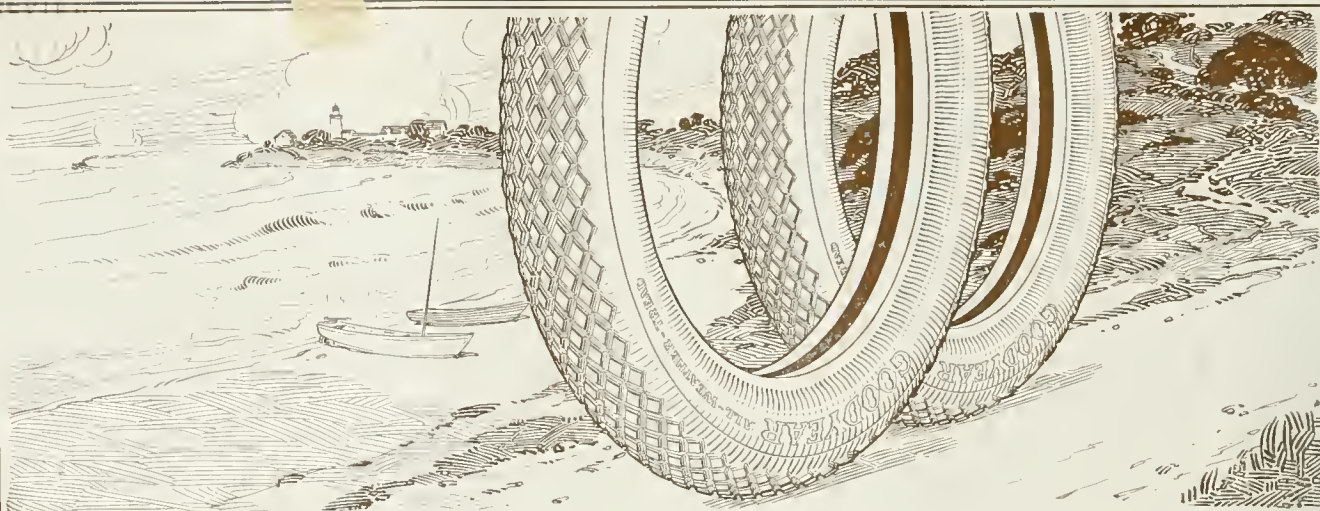
R. G. PHILLIPS, ROCHESTER, NEW YORK
Secretary of the International Apple
Shippers' Association.

The International Apple Shippers' Association will hold their Twenty-first Annual Convention and Apple Exhibit at the Sherman Hotel, Chicago, August 4, 5 and 6. This association has accomplished wonders in assisting the selling end of the apple business. Mr. R. G. Phillips devotes his entire time to the association, being its present secretary. He has done such excellent work in building up and assisting the association that we herewith present his picture on the cover page in order that the fruit growers may become better acquainted with Mr. Phillips, who is esteemed very highly by all those who know him.

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

The Development of the Fruit Package

By E. D. Lake and W. B. Arens.

THE object of this article is to trace the development of the package of the apple, pear, peach, plum and cherry from the time these first appeared on the markets of the United States until the present time; and from the past and present tendencies prophesy what packages the fruit growers of the future will adopt. In the publications of the past which have been available little attention and space has been given to the discussion of the fruit package, which now has become an important phase of the marketing problem. Judging from this, the growing of the fruit was the all-important matter and the marketing was a secondary consideration. The marketing of fruit until recently was a simple matter, since the home markets were able to handle all of the fruit grown locally, and for this reason, and due to the fact that keen competition did not exist, the fruit was placed upon the market in almost any kind of package. Before the year 1840 there were comparatively few commercial orchards of any sort in the United States. Most of the fruit grown at that time was grown in the home orchard, for home use, and only the surplus was marketed. Most of this surplus was carried to the markets in the farmer's wagon and sold direct to the consumer, by peck or bushel, the package not being given with the fruit. For the city retail trade the fruit was marketed in most any package available. Innumerable crude packages have been found upon the markets, varying in sizes and description and being made of every kind of materials.

It was with the rapid development of the fruit industry between the years 1845 and 1860, when hundreds of commercial orchards were coming into bearing throughout the United States, that the question of the fruit package first became of importance. The tremendous amount of fruit being thrown upon the market between the years 1855 and 1860, much more attention was given than formerly to the marketing of these crops. The wholesale market rather than the retail played a larger part in the fruit industry, causing a proper development of the fruit package. The fruit men realized that it was not altogether the fruit which caused a sale, but that the package played a very important part. The fruit was not only displayed to better advantage, but also arrived on the market in better condition. Since the sale of the fruit was handicapped by the use of discolored second-hand packages, the trade came to demand the "gift" package more and

more. During the last half century there has been a general embetterment of the fruit package, until today we find many novel as well as neat and useful packages upon the market.

In the latter part of the eighteenth century a shipment of apples was made from the United States to Benjamin Franklin, who was then in Europe. The fruit, through careful packing, arrived in good condition; this showed

half-bushel hampers are used for shipments of early apples for short distances, not over two or three hundred miles.

There is a third class of package for apples which is just now coming into prominence and which is bound to become of more and more importance. That is the small retail "take-home" package holding from a few quarts up to perhaps a half bushel. These packages are principally of two types, either the basket or carton. They have the advantage, from the standpoint of the consumer, that they can be easily carried in the hand; that they keep the fruit in good condition, and that they hold so little fruit that the question of storage is not important. Thus they obviate the greatest difficulty which is experienced with the barrel and even with the box, namely, that the ordinary household cannot use all of the apples before they begin to decay. An additional advantage of the small package being attractively packed is that the fruit can be much better displayed. In this regard, F. C. Sears, professor of pomology, Massachusetts Agricultural College, might be quoted: "There is also among those who grow very fancy apples a movement to try a still smaller package, particularly of the pasteboard carton type. These have been taken up because the barrel and Western box both bruise the apples too much. A few growers are also trying a carton which holds practically a bushel and which is supplied with partitions similar to an egg case. At a recent meeting of our association (Massachusetts Horticultural Association) we had such a package on exhibition which had been shipped from Virginia to Brockton in this state, then back to Boston, then up to Worcester, where our meeting was held, yet the apples arrived in perfect condition."

West of the Rockies, including Colorado, the apples are nearly wholly handled in boxes. The first shipment of apples from Oregon to distant points was made in 1853, when large boxes bound with iron straps were sent to San Francisco by steamer. The apples sold as high as \$2 a pound. The Oregon standard and California special boxes are used to the exclusion of all others. It is a fact that the Western apple growers market their apples in boxes, in the markets of Eastern cities, and these same markets prefer to have the Eastern apples packed in barrels. It cannot be explained why this should be the case, unless it is because the Western apples are of such superior quality to be demanded by special fancy

Features of this Issue

THE DEVELOPMENT OF THE FRUIT PACKAGE

THE APPLE AS A FARM PRODUCT; HISTORY AND PRESENT STATUS

THREE YEARS OF PRACTICAL EXPERIENCE WITH HOME CANNING

COVER CROPS FOR BEARING IRRIGATED ORCHARDS

MARKETING THE APPLE

the possibilities of the foreign development of the fruit industry and necessitated the use of a strong, substantial package for shipping purposes.

Until recently the form of apple package was chiefly the barrel, which now has a more or less definite size and shape. Formerly there were wide extremes in the type of the barrels found on the various markets, ranging from small kegs to hogheads. Thus it could be seen that many of these would be wholly unsuitable. Apples have been packed in barrels ever since orcharding became a commercial branch of farming. The barrel is the standard package for apples east of the Rockies, and from all indications it will continue to be so for some years to come. In some localities the so-called half barrel has been used for marketing apples on a small scale. The half barrel is nothing more than a small barrel which holds about one-half of the standard apple barrel. Its use is very limited. For high grade fancy apples and for special markets some of the growers are packing apples in the Oregon standard apple box, but the box trade represents insignificant parts of the apple business in the East. Georgia is an exception to this rule, as it packs most of its apples in the Northwestern standard box. The bushel and

trade. The future tendency will probably be that the East and West will continue to use their respective packages with but minor variations. One fact stands out as being established beyond question, namely, that if boxes are to be used at all, the fruit has to be above the average in quality and properly graded, and the whole package must be made attractive. Without these attributes fruit cannot be placed profitably in any market. The cost of box packing makes this type of package almost prohibitive in the handling of the lower grades of fruit. The slatted box and the barrel have been suggested as a means of overcoming this difficulty in the Northwest. The following tables from Bailey's "Farm and Garden Rule Book" show the legal weights to the bushel of apples and the legal sizes of apple boxes and barrels in the several states named; also the usual standard (not legal) sizes of apple boxes and the heaped bushel expressed in cubic inches in such states as have expressed the capacity of the heaped bushel in that form. All of these boxes, where actually used, are subject to considerable variation in capacity, resulting from the use or non-use of cleats under the covers.

BOX AND BARREL SIZES, AND WEIGHTS PER BUSHEL.

Arkansas	.....Green apples	50 lbs. per bu.
	Box size: 20x12x9—lawful bushel measure.	
Connecticut	.....Apples.....	48 lbs. per bu.
Florida	.....Green apples	48 lbs. per bu.
Iowa	.....Apples.....	48 lbs. per bu.
Kansas	.....Green apples	48 lbs. per bu.
Maine	.....Apples.....	44 lbs. per bu.
	Box size: 20x11x10 inches—2250 cu. in.; standard bushel box.	
	Barrel size: Head 17½, staves 28½, bulge 64 inches—3 bushels.	
Maryland		
	Box size: 2212 cubic inches.	
	Barrel size: 6253¾ cubic inches.	
Massachusetts	.....Apples.....	48 lbs. per bu.
Michigan	.....Apples.....	48 lbs. per bu.
	Barrel size: Heads 17½, staves 27 inches, or flour barrel size.	
Nebraska	.....Green apples	48 lbs. per bu.
New Jersey	.....Apples.....	50 lbs. per bu.
New York	.....Apples.....	48 lbs. per bu.
	Barrel size: Head 17½, staves 28½, bulge 64 inches—100 quarts.	
Minnesota	.....Green apples	50 lbs. per bu.
Missouri	.....Apples.....	48 lbs. per bu.
	Barrel size: Heads 17½, staves 28½, diameter center inside 20½ inches.	
North Carolina	.....Green apples	48 lbs. per bu.
North Dakota	.....Apples.....	50 lbs. per bu.
Ohio	.....Apples.....	50 lbs. per bu.
	Barrel size: Head 17½, staves 28½, bulge 66 inches.	
Oregon	.....Apples.....	45 lbs. per bu.
	Standard box: 10½x11½x18—2173½ cu. in.	
	Standard box: 20x11x10—2200 cu. in.	
Tennessee	.....Green apples	50 lbs. per bu.
Texas	.....Apples.....	50 lbs. per bu.
Vermont	.....Apples.....	46 lbs. per bu.
Virginia	.....Apples.....	45 lbs. per bu.
	Barrel size: Head 17½, staves 27½, bulge 64 inches.	
Washington	.....Green apples	45 lbs. per bu.
	Box size: 10½x11½x18 inches.	
Wisconsin	.....Apples.....	48 lbs. per bu.
	Barrel size: 100 quarts.	

OTHER APPLE BOX SIZES.

California	40-lb..20½x10½x9¼	1965 cu. in.
California	50-lb..20½x11½x10¾	2393 cu. in.
Canadian Legal	20x11x10	2200 cu. in.
Colorado	18x11x12	2376 cu. in.
Washington Spec.	20x11x10	2200 cu. in.
N. W. Special	20x12x10	2400 cu. in.

LEGAL HEAPED BUSHEL CAPACITIES.

Connecticut	.....	2564 cu. in.
Kansas	.....	2564 cu. in.
Washington	.....	2564 cu. in.



Courtesy of Southern Pacific Railway

Hay Field, Western Oregon

The history of the pear package does not differ extremely from that of the apple, in that development was along practically the same lines. It is true that the pear industry has not developed nearly as rapidly as has the apple. It has been until recently more of a local proposition with pears, since they will not stand shipping and rougher treatment, nor keep as well in cold storage as will the apple.

On account of the different characteristics of the pear of the East and of the West, and the uses to which the pears are put, the packages would necessarily vary considerably. The half bushel peach basket is commonly used in handling the pear crop for delivery to consumers in the Eastern states. The basket usually goes under the name of five-eighths bushel. This basket, with a slatted cover, is also very largely used in shipping by steamer and otherwise to Baltimore and Philadelphia. The pear box with a middle partition and holding from three pecks to one bushel is very commonly used in the Eastern states. This box is rather attractive and helps to sell the fruit.

In New York and the New England states bushel kegs are very largely used for shipping Bartlett's, Anjou and other pears. A still larger package for shipping pears, smaller and with less bulge than the common apple barrel, holds 2¼ bushels. The Le Conte and Kieffer pears are frequently shipped in regular apple barrels. Sometimes boxes are used for the fancier grades of fruit. There seems to be a diversity of opinion among Eastern growers regarding the most desirable type of package in placing this fruit upon the market. Probably the best package for the local market is the bushel box or the half-bushel hamper basket. For the distant market, varieties like the Kieffer and

Duchess seem to be preferred in barrels. A few of the progressive growers have discovered that the basket can be packed with regular packs almost as conveniently as the box, and that not only are the carrying qualities of the fruit enhanced, but the basket presents a much more pleasing appearance.

The pear growers of the Pacific Coast pack most of their fruit in boxes, as is the case with apples. Most of the pears grown on the Pacific Coast are marketed in the Eastern cities. The box probably being the most economical and efficient package for long distance shipping, has for this reason come into general use. The smaller varieties such as the Seckel are packed in half boxes, and the larger pears such as the Bosc and Anjou are marketed in packages that are somewhat smaller than the standard apple box. The ideal package for the pear will, in all probability, be a half box, somewhat shorter than our standard apple box, practically such as is used by California packers. The following table shows dimensions of some of the pear packages in common use:

Northwest standard pear box	—8½x10½x18½
Pear half box	—11¼x11½x18½
Vermont	58 lbs. per bushel.
Iowa	—45 lbs. per bushel.
Indiana	—2150 cubic inches.
Minnesota	—45 lbs. per bushel.
New Mexico	—Size box, 18x11½x8 inches; 18 lbs. per bushel.
New York	—18 lbs. per bushel; 100 quarts per barrel.
U. S.	—48 lbs. per bushel.
R. J.	—48 lbs. per bushel.
California pear box	—9x11¾x19¾; 50 lbs. per box.
California pear box (export)	—12x11¾x19¾—21 lbs. per box.

With the many different races of peaches under cultivation in the United States it is true that the regions in which peaches can be grown include practically the whole country, and nat-

Continued on page 27

The Apple as a Farm Product—History and Present Status

[EDITOR'S NOTE.—The following article is the beginning of extracts from a thesis prepared by A. Millard, Jr., a young orchardist of Hood River, who graduated from Cornell in horticulture in 1915. Following chapters will appear in future editions of "Better Fruit" during the balance of the year. It contains much valuable information and data, with many original ideas in reference to the fruit industry, the apple in particular, as obtained by Mr. Millard through thorough research work covering a long period. This is one of the ablest and most thorough articles that has ever appeared in print along the lines covered and some good suggestions and sensible conclusions are drawn.]

APPLES are mentioned in some of man's earliest writings, and apples were planted by American Indians before the middle of the eighteenth century. (The writer has seen a specimen of these early plantings at Geneva, N. Y., which is said to be 125 to 150 years old.) We are, however, only concerned with the development of the commercial side of the apple industry in the United States, and correspondingly with the history of the whole fruit trade.

One hundred years ago practically no fruit was imported into this country; only an occasional cask of Mediterranean prunes, raisins, or grapes found its way across the four weeks of water as a very great luxury through the agency of the larger importing merchants of the colonies, and later of the young republic. Even the seasonal selling of the fruit of nearby farmers in cities was not practiced until early in the nineteenth century, and once at this point the trade stood still until about 1830. In 1832 a cargo of oranges arrived from Sicily, and this shipment was followed by a growing commerce in Italian oranges and lemons for thirty years, during which period these fruits held full possession of the American markets. About 1865 wholesale commission fruit houses came into existence, and Italian fruit began to come, consigned to these firms, but about 1880 branches of the Italian concerns were one by one established in New York and elsewhere, and these branch houses have since controlled the Mediterranean fruit trade here.

There was practically no competition by domestic fruit for the American trade till 1867. Oranges and lemons, grapes, raisins, currants, and prunes, fresh, preserved and dried, found only the Yankee apple as American-raised fruit. Even West Indies bananas and pineapples were not shipped in enough quantity to disturb the complete monopoly of the Mediterranean fruit. In 1867 the first car of green fruit from California reached New York, and from then our domestic sub-tropic fruits rapidly took over the United States markets. Lemons from Sicily still find a strong market on account of their flavor, and this, with the banana, rapidly growing in consumption, will always figure heavily in our fruit imports.

The phenomenal development of the banana trade is worthy of some note at this point. The schooner "Reynard"

was the first West Indian "fruiter" when it brought, in 1804, to New York City the first thirty bunches delivered there. Small quantities were subsequently imported, till in 1830 a man named Pearsall landed 1500 bunches, the first considerable shipment. Banana imports grew quite slowly, till 1880, at which date they were listed for the first time separately in the importation reports. Since 1880 the growth of the banana trade has been enormous, and American growers feel the pressure of this competition in more ways than most of them realize. The banana is the "poor man's fruit." In 1912 the continental United States consumed 44,520,539 bunches, or over 60 bananas for each man, woman and child in the Union. These bananas came from the various small countries bordering the Caribbean Sea; Jamaica leading with 15,467,918 bunches of the above mentioned imports. Of the entire banana crop of the world, the United States consumes nearly all (85%) and the remaining 15% is controlled and to a large degree re-exported by the United Fruit Company and a few other concerns. European taste for the banana is being developed, the area available for the production is literally unlimited, and the banana is a most important competitor of any fruit produced in the United States.

Strangely enough at first thought, but logically when we consider that we were then the colonies of an empire which expected to receive and not to give the luxuries of food, we find records of fruit export earlier than of import. This trade began with the apple. There is record of apple shipments to the West Indies in 1841, and the trade probably existed for some time previous to this date. Benjamin Franklin, in London, was sent a package of Newtown Pippins from the 1758 crop, and the sight and taste of these resulted in quite a trade. There is a letter on file (the younger Collinson, writing to John Bartram, "Better Fruit"), written in 1773, stating that the English apple crop had failed and that the market was being supplied by American apples. This letter reads, "They (American apples) are, notwithstanding, too expensive for common eating, being sold for twopence, threepence, and even fourpence an apple." The apple has always been the commercially ranking export fruit of this country. Shipments of ice from the New England ports to the West Indies, which began in 1805, were accompanied by large quantities of apples, and soon after the extension of the ice trade to India and China, which occurred in 1830, apples could be had in the ice ports of these countries. Statistics do not exist prior to 1821, when the Treasurer reported an export of 68,443 bushels of apples, valued at \$39,966.

In the "Transactions of the American Institute" it is said that Boston fruit dealers had shipped apples and cranberries to Europe for many years. "In

1845 Newton Pippins from the orchard of Robert L. Pell, of Ulster Co., N. Y., which contained 20,000 trees, sold in London for \$21.00 a barrel." Virginia apples were also exported about this time. The Eastern States still furnish a large part of the apples exported, but shipments from the great orchard districts of the Mississippi Valley and of the Pacific Coast now are a very large factor. New York City has always held the lead in apple exports of North America, in 1812-13 the approximate percentages of the barrels exported by the various cities were: New York, 32%; Boston, 16% (some few Canadian apples included); Portland, Me., 10%; Halifax and St. Johns, 30%. Boxed apples exported in this same year from the Atlantic seaboard were apportioned: New York, 93%; Boston, 6%, and Portland, Me., 1%. The various apple importing cities of Europe are elsewhere taken up under foreign markets.

Apples comprise by far the greatest amount of our fruit exportations, but various other fruits — cranberries, peaches, plums, prunes, pears, grapefruit, oranges, etc.—are also sent out. The supply of all but the first fruit comes in the main from California. In 1912 over two million pounds of apricots and peaches, over ninety-one million pounds of pears, and over six million pounds of plums and prunes were exported to England. Canada imports considerable quantities of our tender fruits, and most of the countries of Europe, excepting Russia and those bordering on the Mediterranean, import some of our fruit. Dried fruits are also exported in large quantities (the fruit-dryer was perfected between 1870 and 1875.) Belgium imported in 1912 \$310,000 worth of our dried apples, apricots and prunes, and Austria imported about a million and a half pounds of various dried fruits. France imports much, but her orders depend entirely on her own crop. Germany imports a great deal; but Italy, Norway, The Netherlands and Russia import but little dried fruit. England imports in quantity only prunes and plums, of which in 1912 she took twenty-nine million and a hundred and fourteen million pounds respectively. Japan, China and India import very little dried fruit, although there may be a limited field for further exploitation there. Australia does take some of our dried apples, though this commonwealth exports the first fruit in quantity. There is a very bright promise for increase in the dried fruit trade with South America.

We have seen above that there was no domestic competition for the fruit trade in the United States until after the Civil War, except for the poorly developed apple industry and the even less developed small fruit trade from Long Island, New Jersey and Delaware. Exceptions to this condition were occasional boatloads of watermelons, etc., from the South. After this

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time the growth of intra-state commerce in fruits was very strong and very rapid. According to U. B. Barnes, of Middlehope, N. Y., the planting of commercial apple orchards did not receive much attention until 1825, although Robert Pell was already exporting Newton Pippins. Gradually, summer, early and late fall apples became customarily shipped down the Hudson to New York. These apples were often sold by the steamboat captains who carried the fruit to the city. Heavy plantings in Western New York followed the completion of the Erie Canal, which opened in Western New York one of the greatest fruit regions of the world. The 1867 shipment of California to New York City was a failure as regards condition of fruit and prices received, but the idea remained, and pears, peaches, Tokey and other grapes, and later, oranges and lemons followed this firm shipment. This State is today easily first in green fruit production, though prior to 1893, but 5,000 boxes in all of California fruit had ever been sold in New York. Florida oranges entered the market shortly after this first California shipment, and now the more rapid citrus industry in California has outstripped the orange industry in Florida. Florida, however, has the grapefruit, and the two states are keen competitors in the production of domestic, tropical and sub-tropical fruits of all kinds. Early fruits with vegetables are controlled by the Gulf States, and specialized fruit

industries have sprung up in the Rocky Mountain and North Pacific States.

The following tables show the 1909 values, acreage, etc., of small and orchard fruits in the United States:

TABLE IV.—SMALL FRUITS IN THE UNITED STATES, 1910 CENSUS.

	Total Value in 1909	Production in 1909 (quarts)	Acreage	Relative Value
All small fruits.....	\$29,974,481	126,565,863	272,160	100.0%
Strawberries.....	17,613,926	255,702,035	143,015	58.8%
Blackberries.....	3,909,831	55,343,570	49,004	13.0%
Raspberries.....	5,132,277	60,918,196	48,668	17.6%
Currants.....	790,131	10,448,532	7,862	2.8%
Gooseberries.....	517,034	5,282,843	4,765	1.8%
Other small fruits.....	1,810,982	38,870,687	19,116	6.0%

TABLE V.—ORCHARD FRUITS IN THE UNITED STATES, 1910 CENSUS.

	Total Value	Production (Bushels)	Increase over 1899	Relative Value
All orchard crops.....	\$140,867,347	216,083,695	1.8%	100.0%
Apples.....	83,233,492	117,522,318	15.9%	59.1%
Peaches.....	28,781,078	35,470,276	133.0%	20.4%
Pears.....	7,910,600	8,840,733	33.4%	5.6%
Plums and Prunes.....	10,299,495	15,480,170	76.6%	7.3%
Cherries.....	7,231,160	4,126,099	43.6%	5.1%
Apricots.....	2,884,119	4,150,263	57.1%	2.0%
Quinces.....	517,243	428,672	....	0.3%

The acreage of all classes of small fruits decreased between 1899 and 1909 from a total of 309,770 to 272,460 acres, or 12%; likewise the total production was 7.9% less. The only crop with increased production was cranberries. Small fruits in general are grown rather uniformly throughout the United States. In acreage New York and New Jersey head the list, but many states produce crops excelling the New Jersey crop in value. Strawberries come from all sections of the country, but the South Atlantic States are the heaviest producers, having in 1909 a crop worth \$3,500,000, or about one-fifth of the total value of the strawberry crop of the entire country. The increase of value in small fruits is not given for the different crops separately, but as a whole the berries showed an increase in 19.8% in value, with a decrease of 7.9% in total production.

Our grape crop has had a picturesque history since the first vain attempts in colonial days. Ohio and Missouri have in turn lead the other states in production, but today 63% of our crop comes from California, New York and Michigan. Practically all of our European grapes are produced in California, whereas New York and Michigan can produce only native American grapes of the Concord type. The grape crop for 1909 was valued at \$22,027,961, an increase of 57.1% over the value in 1899. The total production in 1909 was 2,571,065,205 pounds.

The following table gives the value of tropical and sub-tropical fruits in the United States for 1909:

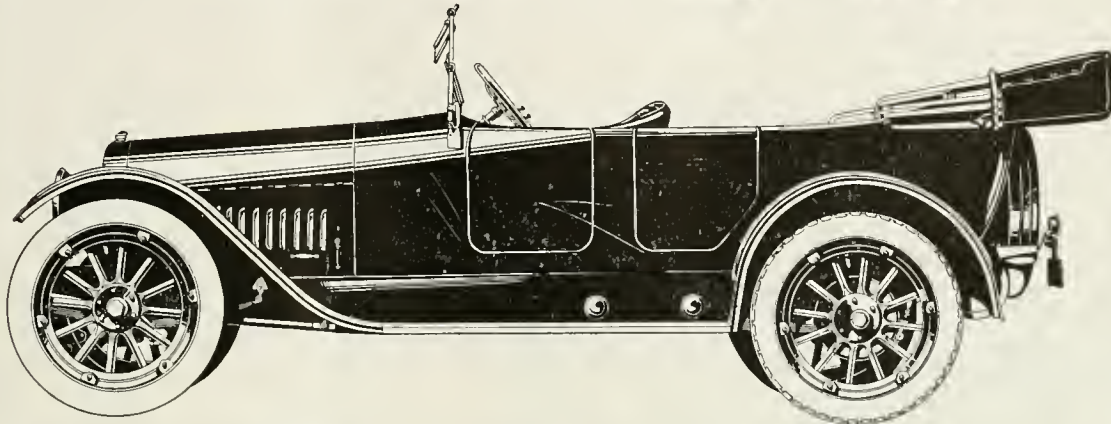
TABLE VI.—VALUE AND PRODUCTION OF TROPICAL AND SUBTROPICAL FRUITS, 1909.

	Total Value in 1909	Production in 1909	Increase of Production over 1899
<i>Non-Citrus Fruits</i>			
Figs.....	\$803,810	35,060,395 pounds	178.3%
Pineapples.....	734,090	778,651 crates	672.6%
Olives.....	404,574	16,405,193 pounds	220.6%
Bananas.....	5,661	10,060 bunches	Not given
Avocado Pears.....	10,100	4,920 crates	Not given
Guavas.....	11,628	35,402 pounds	-78.8%
Mangoes.....	5,739	5,278 pounds	Not given
Persimmons (Japanese).....	9,087	6,723 bushels	148.1%
Loquats.....	5,880	4,541 boxes	Not given
Pomegranates.....	4,203	152,825 pounds	Not given
Dates.....	533	9,947 pounds	Not given
<i>Citrus Fruits</i>			
Oranges.....	\$17,566,464	19,487,481 boxes	217.0%
Lemons.....	2,993,738	2,770,313 boxes	215.9%
Grape Fruit.....	2,060,610	1,189,250 boxes	3,378.7%
Limes.....	12,178	11,318 boxes	-50.0%
Tangerines.....	68,770	38,752 boxes	Not given
Mandarines.....	6,553	3,896 boxes	Not given
Kumquats.....	2,826	1,112 boxes	Not given

The total value of tropical and sub-tropical fruits trebled in the ten years between the twelfth and thirteenth census figures. The production of citrus fruit alone increased 231.3%.

Much of the greater part of the tropical and sub-tropical fruit produced in the United States is grown in California and Florida, the former producing 67.8% and Florida 28.7% of the total valuation. Of the oranges, nearly three-fourths are produced in California, most of the remainder coming from Florida. Nearly the entire domestic supply of lemons comes from California. Although California produces a few grape fruits, the dealers receive nearly the entire supply from Florida. No other class of fruit has increased in production and popularity in the past decade as has the grapefruit or pomelo. The other citrus fruits are unimportant; these are limes, tangerines, and kumquats, chiefly from Florida, and mandarines from Louisiana. The production of figs is widely distributed throughout the Southern States, although California leads with two-fifths of the crop. Arizona and California control the domestic supply of olives—a crop which has trebled in the last decade. Florida is the only source of supply within the United States for pineapples, bananas, Avocado pears, and mangoes. (Discussion, "Small Fruits, Grapes, and Tropical Fruits," largely verbatim copy from "Better Fruit.") The guavas are known only in California and Florida, and loquats only in the former. The native supply of pomegranates and dates come from several of the southern and southwestern states. Japanese persimmon is produced only in California, Florida and Texas.

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Danger of Clover-root Curculio.

The United States Department of Agriculture in the Weekly News Letter under date of April 21st, has called the attention of the fruit growers and farmers to the danger of clover-root curculio. The pest has become more or

less of a national menace as a destroyer of the various legumes. It works in the stems and frequently is unnoticed and for this reason the damage has been frequently attributed to other causes. Recently it has been shown to be a great obstacle to alfalfa growing.

The Department states there is only one practical suggestion at the present that can be made for limiting the devastations of curculio, that is disk-ing or harrowing the fields as soon as the first crop is harvested. This process, it is stated, will destroy vast

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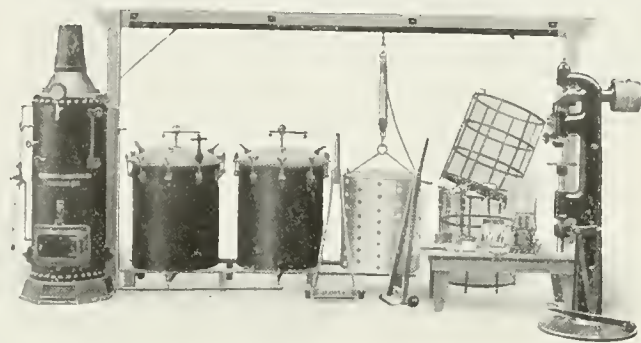
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numbers of the pupae of this insect, which do not descend more than one inch below the surface. Disking and harrowing ought to be done immediately after removing the first hay crop as prompt action even at this time, will not prevent injury to the present crop but should serve to considerably reduce the pest the following year. If your alfalfa looked sick last year and you did not know what was the matter it is time to investigate. It may be this curculio, and, if so, prompt action should be taken, as Government advice is usually unquestionably good. It would seem the proper thing would be to disc it promptly. Some disc-harrows are especially suited for this purpose. The Cutaway Harrow Company of Higganum, Conn., have given considerable time investigating this pest, and fruit growers who have trouble may find it worth while to write this company for further information in reference to this pest.

Why the Apple Is "Food of the Gods"

The apple has become so familiar to us as the commonest of all fruits that its value as man's greatest friend in the vegetable kingdom may not be fully realized. It was called the "food of the gods" because it was believed to be the magic renewer of youth to which the gods resorted when they felt themselves growing old and feeble. There have been many mystic traditions about the apple, which has been credited with varied potency. It is the healing fruit of the Arabian tales. Latin chronicles and institutes and early English poems contain many references to it. Scientific analysis of late years has justified all the ancient glorification of this fruit, which has been found to contain albumen, sugar, gum, malic acid, gallic acid, fibre, water and phosphorus.

Malic acid of apples neutralizes the excess of chalky matter caused by too much meat and thereby helps to keep us young. Apples are good for the

complexion, as their acids drive out the noxious matters which cause skin eruptions. They are food for the brain, which those same noxious matters, if retained, render sluggish. The acids of the apple diminish the acidity of the stomach that comes with some forms of indigestion. The phosphorus, of which apples contain a larger per cent than any other fruit or vegetable, renews the essential matter of the brain and spinal column. England, Normandy and the United States have made the most notable improvement in the quality of the fruit, of which there are between 400 and 500 distinct varieties.

Mr. Howard G. Fletcher Joins the Northwestern Fruit Exchange


Mr. Howard G. Fletcher has resigned his position as General Manager of the Grand Junction Fruit Growers' Exchange of Colorado and accepted a position with the Northwestern Fruit Exchange as Associate Salesman. The Grand Junction Fruit Growers' Association, of which Mr. Fletcher has been manager, is one of the largest and best co-operative organizations in the United States, having been in existence for 25 years, managed previously for many years by Mr. John Moore. Last year it handled a tonnage of 3000 cars. Mr. Fletcher accepted a position with the Grand Junction Association fourteen years ago and by hard work and close attention to business he received many promotions, finally being tendered the position of Manager three years ago, which he has filled with credit to himself and the Association. Mr. Fletcher is not only well known among the fruit growers throughout Colorado, but has an extensive acquaintance with the trade all over United States and is recognized as a man of ability and a splendid fruit sales operator. His acquaintance and knowledge of the business will be a great help to the Northwestern Fruit Exchange.

Half a Million Dollar Loans

The Seattle banks, after numerous conferences through their clearing houses, have about perfected arrangements for financing the growers of the Wenatchee North Central Washington Growers' League for the year 1915, and expect to perfect arrangements to advance the growers of the above district Half a Million Dollars with which to care for and harvest their apple crop during the coming season. This loan probably will be made through the marketing organizations, five of which have been approved by the Seattle banks, as follows: Wenatchee Fruit Growers' Association, North Pacific Fruit Distributors, Northwest Fruit Exchange, Wenatchee Produce Company, and G. M. H. Wagner & Sons of Chicago.

The apricot crop in Southern California will probably be from 30 to 40 per cent of last year's crop.

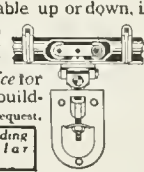
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Three Years' Experience with Home Canning Plant

By C. C. Vincent, Horticulturist, University of Idaho, Moscow

SINCE the fruit industry in the Pacific Northwest has attained such gigantic proportions, many questions of great importance have confronted the best brains and talent for solution; questions of vital importance and far-reaching consequence, that demand careful and faithful consideration by those entrusted with the solution of such problems. Such problems as orchard management, orchard irrigation, maintenance of soil fertility, picking and packing, as well as marketing schemes should be encouraged and helped by both state and nation, but we believe there is another question of vital importance to all the people of the Pacific Northwest that should receive the early attention of investigators, and that is the saving of by-products that naturally go to waste annually on our farms. It was the consensus of opinion at a recent meeting of the National Apple Show By-products Committee that fully 25 per cent of our present investment of \$200,000,000 in the fruit industry in the four Northwestern states went to waste. This tremendous loss affects practically every farmer, orchardist and planter in the country.

For your future prosperity and development can you, Mr. Fruit Grower and Vegetable Grower, afford to let this continue. Decidedly, No. As the sum total of our knowledge is the result and experience of the present as of past generations, we can readily see that the logical thing to do is to establish at an early date plants for the handling of by-products. The fruit growers' organizations, private enterprise, etc., should

immediately take up the matter for the installation of vinegar factories, canning plants, and evaporating establishments. Referring again to a recent meeting of the By-Products Committee, we find in their minutes a statement to the effect that fully 10 per cent of the by-products plants here in the Northwest have been failures.

This state of affairs does probably exist here in the Pacific Northwest, but this cannot be the true condition generally throughout the United States, for, according to the last census report, there has been a gradual increase in the number of canning and preserving plants since 1869. In 1869 there were only 167 successful plants, employing 6,240 men, women and children. In 1909 we find 3,369 plants, furnishing employment to 50,042 people.

A close analysis of the situation reveals the fact that failure has been due primarily to the installation of too elaborate, expensive machinery, which ties up capital and cripples the industry. The essential requisite in the canning of fruits and vegetables is to grow the crop. The products should be grown in large enough quantities to justify the installation of expensive machinery for commercial canning. Mr. M. C. Remelin, manager of the Yakima Fruit Products Company, says that one of the essentials to success in the business is the stability of supply; without this the plant of the most modern design, operated under the most efficient management, will soon close its doors, for the requisite of success is dividends; dividends depend upon sales, and sales depend upon your ability to furnish a dependable quantity of quality goods.

The rapid growth of the canning industry in other parts of the country has been due largely to this stability of supply, efficient management, a thorough knowledge of the various details involved in processing, and the close and constant attention to details. Efficient management is absolutely essential in the operation of a successful canning

factory. A community that can furnish a constant supply of fruits and vegetables over a long period, should have no difficulty in making a canning plant pay good dividends. The length of season for the various fruits and vegetables in and around Moscow, Idaho, is as follows: Asparagus, May 15 to July 1; string beans, July 15 to September 15; corn, August 10 to September 20; peas, June 10 to July 20; tomatoes, August 15 to October 1; rhubarb, June 1 to July 30; strawberries, June 10 to July 15; apricots, July 15 to August 1; blackberries, July 1 to August 20; raspberries, July 10 to August 15; apples, September 1 to December 15.

The annual output from these successful plants is enormous. To show to what extent by-products are utilized, we find that in 1909, 32,752,469 cases of

TABLE I.

	No. of Establish- ments	Wage-earners (Average Number)	Wages	Cost of Materials	Value of Products	Value Added by Manufacture
1909	3,369	50,012	\$15,516,809	\$84,341,019	\$128,772,908	\$44,431,889
1901	2,789	48,499	13,496,784	68,217,318	107,838,309	39,620,991
1899	2,237	41,414	10,189,908	51,257,620	79,904,518	28,616,928
1889	1,202	53,339	5,810,209	23,993,704	39,653,271	15,659,567
1879	520	32,835	2,939,414	13,523,932	20,006,918	6,182,986
1869	127	6,204	885,070	3,939,616	6,668,513	2,728,897

vegetables, valued at \$51,568,914, were sold. A total of 5,501,403 cases of fruits, representing a valuation of \$12,938,474, were also placed on the market. The accompanying table, taken from the Thirteenth Census, shows in detail the various fruits and vegetables canned:

TABLE II.

Kind	Quantity Cases	Value
Canned Vegetables	32,752,469	\$51,568,914
Tomatoes	12,909,986	18,747,941
Corn	7,451,265	10,332,136
Peas	5,901,703	10,247,363
Beans	3,392,861	6,013,098
Asparagus	228,359	1,975,775
Pumpkin	410,303	576,013
Sweet Potatoes	317,286	531,651
All other	2,080,503	3,141,907
Canned Fruits	5,501,403	12,938,474
Peaches	1,467,213	3,753,698
Apples	1,205,712	1,898,720
Apricots	630,185	1,825,311
Pears	637,782	1,833,214
Berries	815,854	1,754,927
Cherries	390,351	1,019,013
All other	351,280	853,591
Dried Fruits	100,328,767	\$19,810,395
Raisins	111,774,767	1,837,933
Prunes	138,498,490	5,130,412
Apples	11,568,244	3,098,095
Peaches	46,813,391	2,123,083
Apricots	29,205,569	2,277,177
All other	29,138,306	2,073,695

To show graphically the value of various canned products, such as fish, oysters, fruits, vegetables and the manufacture of pickles, preserves and jel-

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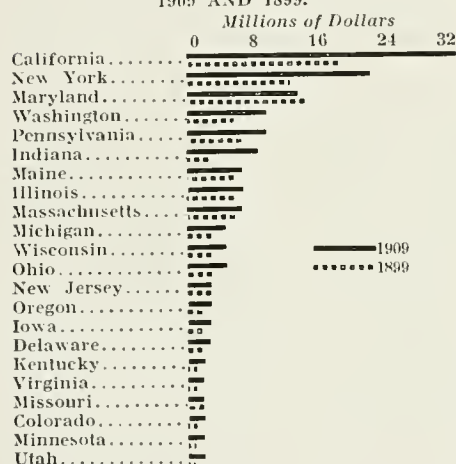
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lies for the leading states, for 1899 and 1909, I wish to call your attention to the following chart:

CHART I.
CANNING AND PRESERVING—VALUE OF
PRODUCTS FOR LEADING STATES,
1909 AND 1899.



In presenting the above figures and charts I do so with a view of showing the true condition existing at the present time. If it is impossible to maintain and manage and at a profit operate a large commercial cannery, possessing all the most modern, improved machinery, etc., I believe the immediate solution of the problem is the establishment of small community canneries, or individual outfits. Such plants can be bought at prices that will come within the reach of all. I see no reason why these smaller plants cannot, under most conditions, conveniently take care of all perishable products that go to waste in certain localities. The Horticultural Department of the University of Idaho has been operating for the past three years, and successfully, too, one of these small plants. The fruit and vegetables are all processed under steam

pressure. These small canning factories cost from \$200 to \$500.

The outfit that was installed at the University consists of two steam-tight retorts, 27 inches deep and 25 inches in diameter, each one holding 144 No. 2 cans, 90 No. 2½ cans, and 21 No. 10 cans. Two galvanized iron crates, in which the cans are placed, are also furnished. These have openings in the bottom and side for free access and circulation of steam. A steam boiler, complete, one blast furnace, two capping irons, tipping irons, iron complete for crane, etc., are included. The daily capacity of the plant depends almost entirely upon the speed of the employees, as well as the number employed. The claims of one manufacturer are that from five thousand to ten thousand cans per day can be processed, depending, of course, entirely upon the kind of goods packed. We employ one man to solder and tip the cans and to care for the boiler; another to load and unload the crates, to take away the cans and attend to the blanching and scalding; a woman to fill the cans and prepare them for the capper. Then enough girls to prepare the fruits and vegetables for the cans. The length of time it takes one person to prepare fruits and vegetables is as follows: Peas, 12 pounds per hour or 120 pounds per day; beans, 8 pounds per hour or 80 pounds per day; tomatoes, 37 pounds per hour or 370 pounds per day; peaches, 34 pounds per hour or 380 pounds per day; apricots, 22 pounds per hour or 220 pounds per day; pie cherries, two gallons per hour or 20 gallons per day; cherries, 45 pounds per hour or 450 pounds per day; raspberries, 10 minutes per crate, six crates per hour, or 60 crates per day; strawberries, one crate per hour or ten crates per day.

The following table shows approximately the capacity of our home cannery, that we have installed at the Idaho Experiment Station, prepared on the basis of one person filling cans. As it can readily be seen, the output of this plant could be doubled by increasing the labor, as the retorts are not kept busy the entire day. (For length of time required to process the different fruits and vegetables, see table.)

TABLE III.

Number persons employed—	Toma- Peaches totes Peas		
Filling	1	1	1
Shelling or peeling.....	2	3	6
Soldering and processing...	1	1	1
Number cans per hour.....	32	33	37
Number cans per day.....	320	330	370
Size of cans.....	2½	2½	2
Number pounds raw material—			
Per can	1¾	2¼	2
Used per day.....	560	742	740

The yield will vary according to the general care of crops, condition of soil, etc. Peas at the station have yielded at the rate of 6,188 pounds or 206 bushels per acre. A bushel of unshelled peas weighs 30 pounds. To keep the plant supplied with peas for one day would require the produce from one-eighth of an acre. At the rate of seven tons of tomatoes per acre, it will take the product of one-eighteenth of an acre to keep five people employed daily. To turn out 320 No. 2½ cans of peaches per day it will require 25 boxes. From the above data, you can readily see that it would take the products from a great many farms to keep a \$500 plant supplied, let alone a \$2,000 factory.

We have endeavored to ascertain as accurately as possible the actual cost of packing the various fruits and vegetables. Summarizing our figures for the past three years, the average cost per case shows to be as follows: Peas, \$1.89 for No. 2 cans; beans, \$1.57 for No. 2 cans; tomatoes, \$1.73 for No. 2½ cans; corn, \$1.91 for No. 2 cans; peaches, \$1.86 for No. 2½ cans; apricots, \$2.21 for No. 2½ cans; raspber-

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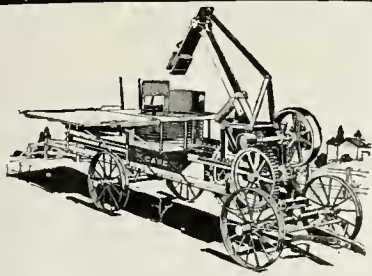
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ries, \$1.64 for No. 2 cans; dewberries, \$1.61 for No. 2 cans; loganberries, \$1.66 for No. 2 cans; Royal Ann cherries, \$2.12 for No. 10 cans. A case will hold 24 No. 2 cans, or 24 No. 2½ cans, or 12 No. 10 cans.

How profitable a factory of this kind will be will depend largely upon local conditions; for the condition of the crop, expense of labor, location as to market, all have a material influence on the profits obtained. To show the possible profit from an acre of different products we present the following:

TOMATOES.

Average yield per acre, 7 tons or 259 cases.	
Cost of canning per case.....	\$0.6120
Cost of cans per case.....	.9216
Cost of case and labels.....	.1978
Total cost of canning.....	\$1.7314
Wholesale price.....	\$2.20
Total cost.....	1.73
Profit.....	\$0.47
Net profit per acre.....	\$121.73

BEANS.

Average yield per acre, 2,400 lbs. or 138 cases.	
Cost of canning per case.....	\$0.6120
Cost of cans per case.....	.792
Case and label.....	.1478
Total cost.....	\$1.5734
Wholesale price, per case.....	\$2.40
Cost of canning.....	1.57
Profit.....	\$0.83
Net profit per acre.....	\$114.54

The cost of production can be reduced materially if cans, labels, etc., are bought in carload lots. Plain sanitary No. 2 fruit cans will cost approximately \$29.75 per thousand, f. o. b. Portland. The enamel No. 2 cans cost \$33.25 per thousand; No. 2½ plain, \$34

HUGO E. BIRKNER, Arborist

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per thousand; No. 2½ enamel cans, \$38 per thousand, and the No. 10 enamel cans cost \$78 per thousand. These prices include solder-hemmed caps, which cost \$2 per thousand. In the cost of production we paid the above prices for our cans plus the freight; 15 cents and 20 cents per hour for labor; approximately \$2.25 per thousand for labels, and 8 cents, 12 cents and 18 cents apiece for cases, f. o. b. Spokane.

The Cutler Fruit Grader Company

On June 29 the extensive factory of the Cutler Fruit Grader Company, including machinery and equipment, was burned to the ground. The building and machinery was owned by Cutler Bros., two enterprising orchardists of Hood River. Three years ago they worked out a patent for a fruit grading machine and continued to use it each year themselves in their own orchard, which is one of the best orchards in Hood River Valley, and by practical experience improved it from year to year. Originally Cutler Bros. put out a machine that graded by measurement. They became convinced that a more perfect grading machine could be produced if the sizing was done by weight, and after working a year on this difficult problem they reconstructed their machine, carrying out all the original good features, which had proven good by practical experience, producing a machine that graded by weight instead of by measurement. The experimental machine gave such perfect satisfaction in actual practice that they became convinced that it was absolutely the most perfect process of any they had tried, consequently they were busy manufacturing machines for this year. They inform us that they will immediately make arrangements for building these machines and will be able to furnish all growers who want them, although there will be some delay, and instead of being able to make deliveries in July they will not be able to make them until some time in August.

The machine which was designed for demonstration at the Panama-Pacific Exposition was burned, and for this reason Cutler Bros. have been compelled to cancel their arrangements and therefore will not exhibit their grading machine at the Panama-Pacific Exposition.

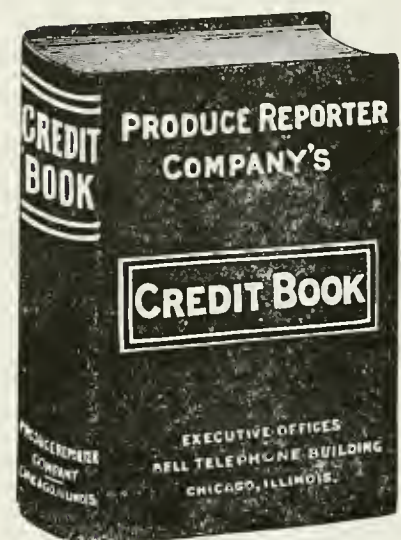
The Commercial Bank and Trust Company of Wenatchee, Wash., has issued a very interesting booklet with a very attractive cover, entitled, "What your neighbor is doing," which contains a number of interesting and instructive short articles of the fruit growers in the Wenatchee district, giving a brief account of what each one is doing, with a view to showing principally the value of diversity in connection with the fruit growing industry. There are many good and practical illustrations showing how fruit growers through diversity have produced an extra and steady income in addition to their fruit crops.

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Produce Reporter Service operates on the correct co-operative principle for the mutual benefit and protection of members—it enables the smallest shipper to profitably compete with the largest "Distributor." It affords the only practical solution of your problem—write us today for full information—you incur no obligation whatever in doing so.

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A Monthly Illustrated Magazine Published in the
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All Communications Should Be Addressed and Remittances
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Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

The Apple Crop of 1915.—Last year, it is generally assumed, the apple crop of the United States amounted to fifty million barrels. The Agricultural Optimist estimated the crop at forty million barrels. In all probability the former estimate of fifty million barrels is more nearly correct. Apparently, from general reports all over the United States early in June, the apple crop this year is the shortest the editor remembers in the last thirteen years, during the time he has been an apple grower. The consensus of opinion seems to estimate the crop of the United States at about fifty per cent of last year, or in all probability less than fifty per cent of last year, which would mean twenty to twenty-five million barrels. However, there is much in store in the way of the June drop, which has not been reported on fully at the time of going to press with this edition. Drouth and disease are apt to be factors in reducing the crop during the balance of the year, so it seems safe to assume at the present time that the apple crop of the United States will probably not exceed fifty per cent of last year and maybe less. Every year during the last thirteen years in which the editor has been engaged in apple growing in Hood River, when the crop did not exceed thirty-five million barrels the apple grower got good prices, so the prospect this year looks very good indeed for good money for the grower, as well as for the dealer.

Cover Crops.—The orchard industry of the Northwest has been given somewhat to extremes, probably due to the fact that a large percentage of orchardists were comparatively new in the business and followed the example of a

few leaders. Frequently some leaders are hobbyists, therefore the Northwest has occasionally gone to extremes in the past. This has been noticeably true in reference to clean cultivation. Too much clean cultivation has exhausted the humus of the soil and depleted the nitrogen content, and therefore many orchards are bearing less than they should and the general condition of the orchard is somewhat off. This is indicated both by light crops and light colored foliage, the leaves frequently turning yellow too early in the fall. The orchardists are now turning to cover crops. July and August are good months for sowing. If your orchard is not bearing right or does not have the right colored foliage investigate cover cropping. The cover crops most frequently used are clover, alfalfa and vetch.

A good many orchardists who have planted cover crops in the orchard do not understand that they require considerably more water, consequently many orchards are suffering instead of being benefitted by cover crops, because the fruit grower does not irrigate sufficiently. Cover crops take the moisture from the soil very rapidly, leaving not enough for orchard requirements, therefore fruit growers who have cover crops in the orchard should give the matter especial attention and see that the moisture condition is maintained evenly throughout the orchard and that the soil is kept in a nice moist condition during the balance of the growing season.

Home Canning.—The fruit grower, more than anyone else, should put up enough canned fruit to last until the next year. They can do this because the only cost involved is the cost of production. Every fruit grower should have a home canning outfit. These can be obtained at a very reasonable price. The advantages of home canning outfits are many. The work is done scientifically, without any danger of spoiling. It is done more rapidly. A home canning outfit can be operated by gasoline, which costs a great deal less than the amount of wood that is required where canning is done on the cook stove, besides when the weather is hot during the summer a home canning outfit is much more comfortable, as it can be operated outdoors, instead of heating up the kitchen. In addition to this, a home canning outfit operates much more rapidly and saves time.

Scab.—Scab is more or less prevalent in humid apple districts this season, with a considerable quantity in semi-arid districts. The experiment stations have devoted considerable time to this subject in various sections throughout the Northwest. An excellent schedule for prevention of scab has been prepared by the Agricultural College at Pullman, Washington, which gives excellent advice. The experiment station at Corvallis, Oregon, has had to contend with scab more than any other experiment station of the Northwest. Their

recommendations have been excellent, but the main trouble seems to be that the fruit growers do not follow instructions. Excessive scab this year in nearly every instance is due to one of the following causes: Not spraying with the right fungicides; not spraying at the right time; not spraying thoroughly or not spraying frequently enough. In nearly every case where there is an excessive amount of scab, where careful investigation and inquiry has been made it has been ascertained that the grower has been remiss in some one of the requirements referred to in this brief editorial.

Tree Propping.—Orchardists are generally becoming more progressive every year, the business now being done in a very scientific and efficient manner. It is the aim of "Better Fruit" editorially to call attention to many features in connection with the orchard business that will be helpful to the grower.

There is nothing more short-sighted than for orchardists to allow the limbs with heavy loads to be weighted down to the ground. The loss is severe, as many limbs break off if not carefully propped. In addition to this, when limbs are severely bent with heavy loads they never fully go back, nor can they be pulled back to a natural, normal, upright position. Consequently it seems wise that the fruit grower should be urged to begin propping early and we would advise them to do the job very thoroughly, too.

A good many growers use forked sticks which they get out of the woods, but these are not very satisfactory and are difficult to obtain in many districts, where there are no forests from which to secure them. Consequently tree props have been invented which are very efficient and which are so constructed that the limbs are not bruised when they are propped.

"Better Fruit" aims to secure advertising from all firms who have any modern conveniences for the orchardist, in order that he may be informed of the latest and best articles on the market.

Apple Graders.—The editor of "Better Fruit" bought the first apple grader which was ever sold in the Northwest, in the year 1911. Since then several different makes of grading machines have been invented and are being put on the market, all of them giving very good satisfaction. Growers have found by actual experience and also by observation that by using grading machines in packing houses a saving of from five to ten cents per box can be made in the harvesting expenses. Therefore we suggest to all growers the advisability of investigating the different fruit sizers which are being placed on the market this year and purchasing what they want in time to make a saving on this year's crop.

This year the growers want to make as much money as possible and at the same time to save as much money as possible.

The Apple Crop of the Northwest for 1915.—The largest apple producing districts of the Northwest are: Yakima, Wenatchee, Hood River and Southern Idaho. Last year Hood River had over 1,300 cars, Yakima about 6,000 cars, Wenatchee about 5,500 cars, Southern Idaho probably around 500 cars. Conservative reports at the present time from these districts indicate that Yakima will have about one-third of last year's crop, or about 2,000 cars; Wenatchee is figuring on about 75 to 80 per cent, which would be about 4,000 cars. This probably puts Wenatchee's estimate a little high, as the crop certainly is not heavy. Southern Idaho seems to be comparatively strong compared with last year; various estimates place the probable output at from 500 to 600 cars. Rogue River had about 200 cars last year and may be to 300 cars this year. Montana will have probably 50 cars this year, more or less. Estimates seem to vary greatly from Colorado, all the way from 3,000 to 500 cars, which is very indefinite. Watsonville, California, will probably have 75 per cent of last year, or about 3,000 cars. Altogether the Northwest would size up somewhere from 40 to 50 per cent of last year's crop, maybe less. However, the growing season has been good and apples have attained splendid size up to July 1.

Attention has been called elsewhere in this edition to cover crops, showing the necessity of cover cropping. Attention is also called to the fact that cover crops can do serious injury, therefore it is wise in connection with that editorial to call the reader's attention to an article on "Cover Crops," which contains very interesting information.

The Editor takes pleasure in calling the attention of the reader to the begin-

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CATALOGS AND
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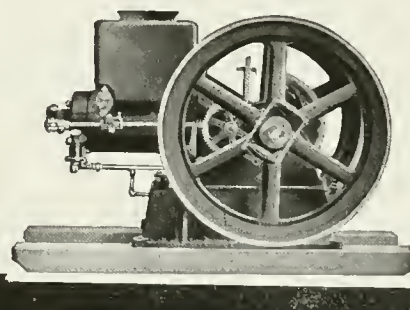
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a machine is a
yearly increase
in number purchased
by people who
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ning of a series of articles by A. Millard, Jr., the first of which appears in the July edition of "Better Fruit," continuing in successive numbers during the balance of the year, for the reason that these articles will contain much valuable information for fruit growers, and especially those engaged in the apple business.

Canning.—The July edition is off the press just in advance of the canning season, therefore with wise forethought this edition contains an excellent article by Professor C. C. Vincent of the Idaho Experiment Station, Moscow, Idaho, on "Canning." Professor Vincent has made a very thorough study, doing much practical work in home canning, consequently this article will prove interesting, instructive and very valuable to all people who intend to do home canning.

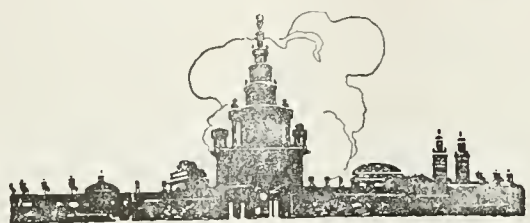
Summer Pruning.—July and August are the months when summer pruning is usually done. The editor desires to comment that while summer pruning is considered advantageous in increasing the crop it should be done with extreme caution, as frequently orchards suffer from summer pruning done unintelli-

gently. Orchards can be damaged more than benefitted by injudicious summer pruning.

Marketing.—This edition contains a very excellent article of good common sense and good advice by Mr. J. F. Segrue, one of the most popular fruit growers of the Northwest, known generally all over this country as well as elsewhere as "Barney." Mr. Segrue is manager of one of the Cashmere Fruit Associations. He is a large orchardist and, it is a pleasure to say, a very successful one.

Economy This Year

Many fruit growers will undoubtedly find their young orchards are this season producing a pretty nice crop of apples. Many of them are short of money on account of last year's low prices, and therefore it is important for them to economize in every way possible. Every fruit grower needs a packing house of some kind. Perhaps he has a barn or shed which will be sufficient or which may be made sufficient with a little additional room. He finds that he is not in a position to build a packing house, which would



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ZEROLENE
the Standard Oil for Motor Cars
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the Gasoline of Quality

cost anywhere from \$1,000 to \$5,000; the size of his crop will not justify such an expense. The editor has given this matter considerable attention and last year found a grower who had solved the problem of furnishing additional room at a very small cost by having a large tent made. The editor called on the manager of the Portland Tent and Awning Company, Portland, Oregon, and ascertained that a grower can get a tent 30 feet by 40 feet, with walls about 7 feet high, which will furnish a splendid quantity of room, at a price somewhere between \$60 and \$80, according to the thickness of the canvas. The tent manufacturer will make a tent to order in any size desired and from any ply canvas.—Adv.

Palace Hotel, San Francisco, California

Since the Palace Hotel, San Francisco's historic hostelry, inaugurated its sweeping advertising and publicity campaign to acquaint the public with its reduced rates and at the same time to correct unjust and misleading statements regarding the hotel rates of this city during the Exposition year, ranchers, vineyardists, orchardists and dairymen are finding the Palace a popular and convenient gathering place. The

reason for this is that when the Palace established its new rates and installed new features in connection with its service, the management had in mind meeting the particular needs of this class of patronage. In making its reduction in rates the Palace Hotel has won the endorsement and praise of the board of directors of the Panama-Pacific International Exposition, the leading hotels of the country, and also favorable editorial comment from many of the leading newspapers of the country. As a result of this generally favorable attitude and the fact that San Francisco is the scene of the great World's Fair, it is the consensus of opinion that, despite many unfortunate conditions this year, the attendance at the Exposition will be considerably increased and that the Palace will be generously patronized by all classes.—Adv.

Duplex Box Strapping

We would refer our readers to page 22, where they will see illustrations and interesting matter regarding a box strapping that is being introduced for use on apple boxes. This is the kind of strapping which is being used exclusively by the citrus fruit packers of California. Its use strengthens the

package, prevents pilfering, and insures the arrival at destination in good condition. The expense of using this Duplex strapping is so small that it is hoped that by calling it to the attention of the apple packers and shippers its use may become general in apple packing houses, as it has in the orange and lemon shipping districts of California and Florida. Mr. A. C. Rulofson—so long identified with the cement-coated nail industry and one of the best known men among the fruit packers—is the Pacific Coast agent for this specialty, and he will gladly furnish samples and information to all interested.—Adv.

BORDEAUX MIXTURE

FOR THE CONTROL OF SCAB AND
ANTHRACNOSE ON APPLE
TREES.

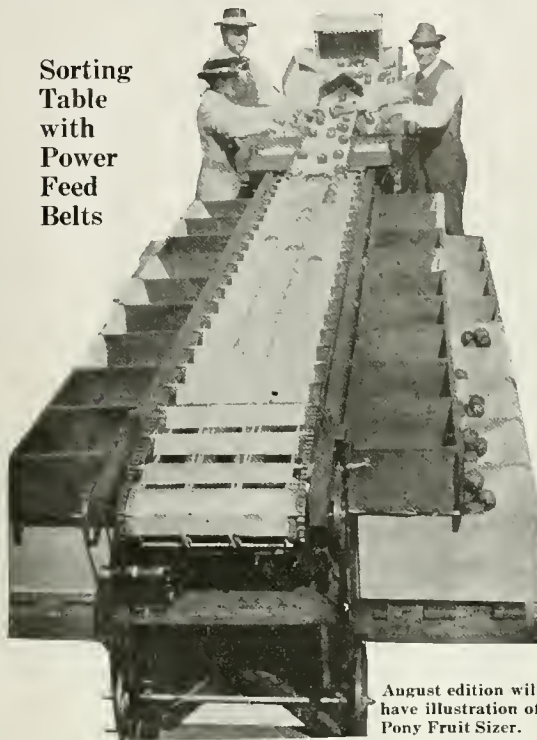
To those fruit growers who intend using bordeaux mixture this summer and fall we wish to call attention to the following:

In the use of bordeaux mixture during the growing period it is important to use the best, properly balanced preparation obtainable. “Orchard Brand” bordeaux mixture paste is so prepared (the result of careful chemical analysis, special knowledge and the right equipment) as to give the greatest possible efficiency. There is no waste of material, no clogging of nozzles and no loss of time in dissolving bluestone and slacking lime. No cumbersome mixing tanks are necessary; simply stir the paste to a uniform consistency in the original container, weigh out amount needed and dilute in proper amount of water.

“Orchard Brand” bordeaux paste is a time saver, is economical and is effective because it is properly made. It has as great advantage over the home-made bordeaux mixture as the commercial lime-sulphur solution has over the old home-made product. S. W. Foster, entomologist, General Chemical Company, 201 Sansome Street, San Francisco, California.—Adv.

Palmer Fruit Sizer

Sorting
Table
with
Power
Feed
Belts



August edition will
have illustration of
Pony Fruit Sizer.

Standard Machine

Floor space 6x24 feet.

Sizes three grades at a time. Capacity two carloads daily.

First grade into nine sizes.

Second grade into four to six sizes.

Third grade into three to five sizes.

Pony Machine

Floor space 6x12 feet.

Sizes two grades at a time into four or six sizes as desired.

Capacity one carload per day.

Either machine can be used for boxes or barrels. Openings on both machines expand uniformly from 1½ inches to 4 inches square.

Illustration shows sorting table attachment; also travelling belts for sorting table.

Machine discharges the fruit into boxes or barrels without bruising.

Box packing can be done direct from the machine or, if preferred, on separate tables, giving the grower a chance to work his packers on the particular sizes and grades he wishes packed first.

Write or wire for catalogue and prices.

PALMER BUCKET COMPANY, Hood River, Oregon

Cover Crops for Bearing Irrigated Orchards

By Lee M. Lampson, Pullman, Washington

THE following discussion is based upon a farm-to-farm study of the use of green manures and cover crops in the Yakima and Columbia River valleys, particularly in Benton County. Most of our irrigated soils are naturally deficient in nitrogen and organic matter. The practice of clean orchard cultivation has also greatly aggravated this condition by causing the vegetable matter of the soil to decay and disappear. Hence the importance of orchard soil improvement by means of green manure and cover crops.

Many orchardists early appreciated the importance of maintaining soil fertility, and during the last ten or twelve years the various cover crops have been extensively tested; consequently, very satisfactory methods of growing and using these crops have been worked out. This paper is the result of a study of these farm methods. The primary purpose of this paper is: (1) to present the soil-building value of green manures and cover crops; (2) to discuss the growing and management of the crops found best adapted to this purpose, and (3) to show how cover crops may be profitably used for hay and pasturing swine.

As previously pointed out, most of our irrigated soils are deficient in nitrogen and organic matter. Under these circumstances the following conditions

usually prevail: The water-holding capacity of the soil is too low; desirable bacterial life is insufficient; the soil dries out quickly; available plant food is inadequate for good crop yields; the soil is improperly aerated. In addition to the above, the fine-grained soils run together and bake and are difficult to cultivate. Green manure and cover crops correct these conditions. The roots of these crops permeate the soil to a considerable depth. The addition of vegetable matter makes most soils more friable, increases their water-holding capacity, improves soil aeration, increases bacterial activities—in short, builds up soil fertility.

The cover crops in use at the present time in Benton County may be divided into two classes, the cereals or small grains, and the legumes. The cereals—wheat, oats, barley, rye, etc.—are not the best crop to use as green manure or cover crops. Orchard soils usually need both humus and nitrogen. These crops cannot make use of the atmospheric nitrogen, and when plowed under or worked into the surface soil add only vegetable matter but little or no nitrogen. Generally speaking, they do not do well on gravelly and sandy soils. They also require the expense and work of reseeding each year. While it is sometimes necessary to sow rye in order to keep sandy soil from drifting,

the use of this crop in this way should only be considered as a preparation for one of the permanent leguminous crops.

Leguminous crops, when grown under favorable conditions, have the nitrogen-gathering nodules on their roots. They are capable of increasing the nitrogen content of the soil by using the nitrogen in the atmosphere. This is a very important point, since arid sage-brush land is low in nitrogen. In addition to this, when plowed under the legumes increase the vegetable matter in the soil just the same as do the cereal crops. The legumes generally used for green manures are red clover, hairy or winter vetch, and alfalfa.

Used as a cover crop, clover adds both humus and nitrogen to the soil and is easily eradicated. It is not as good a crop for our localities as vetch or alfalfa. Clover requires considerably more water than alfalfa and a great deal more than vetch. Its root system is near the surface, and in order to keep the clover growing the upper layer of soil must be kept too wet for the trees. Orchards may be injured, not only temporarily but permanently, by such over-irrigation. Clover is also easily crowded out by grasses and other weeds. If it is sowed solidly in peach orchards and left more than two years, in nearly every case the foliage of the trees becomes yellowish and the



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\$2.50	\$3.00	\$3.50
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trees assume a sickly appearance; furthermore, if clover is worked into the soil by plowing or disking, considerable expense and work will have to be incurred each year in reseeding.

If the cover crop is to be grown purely as a soil-builder, vetch is unquestionably the best thing that has been tried in Benton County. If the crop is to be continued year after year, it is allowed to stand until a portion of the seed has matured before being disked or plowed under. In this way the crop reseeds itself each year. Where the crop is heavy it is often necessary to cut it up with a sharp disk before plowing it under. If the water supply is limited, the crop is not worked into the soil until the end of the season.

During the fore part of the growing season vetch requires considerable water. Early in the summer the vetch ripens, goes down and forms a thick mat that completely covers and shades the surface of the ground. This materially lessens evaporation and decreases the amount of water necessary for irrigation. We have conservative farmers who claim that no more water is required to produce vetch in this way than to clean cultivate the land. While it takes more water in the spring when growing, it requires much less water during the hot part of the summer, because the crop is ripe and forms a dead mat on the surface of the ground. Vetch is sown during the latter part of summer or early fall. If a

reasonably thick stand is desired the first year, 25 to 30 pounds of seed should be sown per acre, and this inoculated. Our experience does not warrant the sowing of spring vetch. To get rid of vetch plow it under in the spring, before the seeds form.

If it is desired to raise some hay or utilize the crop for pasture and at the same time build up the soil, alfalfa is better than vetch, because it will add humus and nitrogen to the soil and will produce more and better feed. The alfalfa that is grown in an orchard should not be used for hay unless it is to be fed to livestock and the manure returned to the soil. One of the best ways to handle alfalfa as a green manure and a hay crop at the same time is to cut the first two crops for feed and cut and disk the next two crops into the ground. This will add nitrogen and humus to the soil rapidly and at the same time furnish a good supply of hay. This will save considerable expense where hay has to be bought the year around. Alfalfa takes considerably more water than vetch. It is also harder to plow up, should it be desired to get rid of it. This last is not a serious objection, however, if it is done in the right way. The essential point in getting rid of alfalfa without difficulty is to plow very shallow just before freezing weather, having the plow absolutely sharp. This will cut the crowns off and leave them near the surface, so that they will freeze during the winter.

Alfalfa can be sown solid in orchards without injurious results after the trees are four or five years old, providing they have made a good growth up to that time. Otherwise clean cultivation should be practiced a few feet on each side of the trees until they are thrifty and vigorous.

I would not feel that a discussion of cover crops was complete unless I at least briefly presented the most profitable method we have found of using them. The practice of pasturing down the cover crops with hogs has been very profitable where it was done properly. There are some who want to carry on only one farm enterprise and seriously object to such a thing as a hog on the farm, but the most of us are farming primarily to make money and we cannot afford to let our likes and dislikes influence our decision in operating the farm. The two questions that arise here are: Will the hogs hurt the orchard? and, will they pay?

Only occasionally hogs will injure matured trees. When I hear a man say that hogs won't hurt trees I know he is drawing his conclusions only from his own experience or very limited observation, and that he is mistaken. When I hear a man say you can't run hogs in an orchard because they will injure the trees, I also know he is drawing his conclusion from very exceptional cases. If time would permit, I could give you the results of a farm-to-farm study on this problem in the Yakima and Columbia River valleys. The results, if tabulated, would show in about the following proportions: 1

find ten farms where the hogs have hurt the trees more or less. On eight of these farms one of two conditions exist—either a large number of hogs are confined around a few trees, or the hogs have become poor because their ration has been nothing but roughage (alfalfa, clover, waste fruit, roots and the like). I find on the other two of these ten farms the hogs have done a slight amount of harm even where they have been well cared for. On the other side of the question, I find ninety farms where the hogs have not harmed the trees in two to seven years' experience. This makes two out of one hundred farms on which the hogs have been properly fed and cared for where they have injured the trees while pasturing down the cover crops. Now, it doesn't do any good to say "properly fed" unless brief mention is made of how the feeding is done in the successful places, because indefinite information is worthless.

Feeding hogs would be a long discussion in itself. So, to be as brief and concise as possible, the failure in raising profitable hogs and preventing injury to trees while pasturing cover crops are practically all due to getting the hogs poor and stunted by feeding them nothing but roughage. Enough concentrated feed to keep the hogs thrifty is absolutely essential. For pigs and shoats this will be about a two per cent grain ration—that is, two pounds of grain for one hundred pounds of live weight of hogs. Now, I hope no one will contradict this statement of facts because he has seen someone keeping brood sows or other mature hogs fat on pasture alone. Mature hogs, if placed on pasture while in good condition, can be carried in that condition on roughage, but pigs and shoats positively will not keep fat enough to grow good without a small amount of concentrated feed.

Will the hogs in the orchard pay? I will cite only two or three of a number of illustrations that might be given. The following experiments were carried on with grade Durocs. A farmer who is a good feeder was induced to weigh his hogs in and out and keep accurate accounts of all feed except roughage (that is, the pasture and waste fruit). To make a long story short, he grew the hogs for 3.6 cents a pound, not including the roughage. The hogs sold at 7½ cents per pound. This left him 3.9 cents per pound to cover the cover crop pasture and the waste fruit and his work in looking after them. These hogs were fed enough grain to keep them reasonably fat from the time they were weaned until they were marketed, which time was four and one-half months. Another man kept figures and he lost \$105.60 on thirty head. Don't let this next point slip by you. His pigs were run on alfalfa alone after they were weaned until they got poor. At the same time another farmer was keeping figures for us. He bought the grain at the same place and he got \$82 for the pasture and waste fruit put into 18 hogs in four and one-half months.



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WINANS' PATENT

FIRST AID TO FRUIT TREES Winans' Net Tree Support

Prevents fruit-laden trees from breaking, holding the limbs up more efficiently and at much less expense than propping. Holds limbs in place, preventing damage and dropping when the wind blows. Meshes are large enough so fruit can be picked through them—open at bottom so picker can get inside the net, or net can be removed at picking time.

This net of finer mesh will keep the birds from eating the blossoms or fruit in districts which are thus troubled.

For further particulars, descriptive circulars and price lists, write

W. ROSS WINANS, Hood River, Ore.

These few typical illustrations will show that hogs in the orchard are profitable if properly fed.

The above recommendations on planting cover crops, the kind of cover crops and the use of them, are made only after going over more than seven hundred farms in the Yakima and Columbia River valleys and studying in detail every plan of cover cropping and clean cultivation in orchards of different kinds and ages and discussing the subject from every angle with the owners. After this study a cover crop of some kind is strongly recommended, both to improve the soil, save water and the expense of clean cultivation, and the pasturing of the cover crops is recommended because it has been found to pay.

Method and Value of Thinning Fruit

"It is becoming more and more apparent that under our present market conditions Oregon growers must produce the very highest percentage possible of first-class fruit if they are to make good money from their orchards," says Professor W. S. Brown, extension horticulturist of the Oregon Agricultural College. "Thinning fruit, especially apples, pears and peaches, is a practice which has been tried for some time in most of the specialized fruit districts of the Northwest and has proved to be of great value in growing fruit of the best merchantable quality. Fruit growing districts of the East are beginning the practice also.

"Thinning may be done either by pinching or twisting off the stem with the thumb and fingers or by using small shears or pruners. In either case great care must be taken not to loosen the stem of the remaining fruit or to break the fruit spur. An orchard foreman must watch the ground carefully to notice when workmen are careless in this respect.

"The specimens should be left widely separated enough so that when mature they will not touch. Whenever they come in contact with each other fruits are apt to rub, or may offer a convenient place for codling moth larvae to start their burrows, or in the case of highly colored varieties, cause the fruit to be off-color at that spot. To avoid touching, young apples, pears and peaches are thinned to four to seven inches apart, depending upon the variety.

"On apples and pears thinning is done for the most part just after the June drop. Peaches grow so rapidly and set so abundantly, as a rule, that they are often thinned before the 'drop' is over. Many growers, however, make a secondary thinning of apples and pears in the latter part of summer, when cultivation is over and the work is slack, in which they take off specimens that have bad scab spots, worm infestations, rubs, sunburn and the like.

"Thinning is a form of harvesting, in a sense, and what it may cost may be rightfully charged to harvesting. It has

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LITHOGRAPHED PAILS
GALVANIZED BUCKETS
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the advantage, however, of coming during the long days of summer, when the work is not so rushing as at harvest; of saving the vitality of the tree, which would be expended in maturing the crop; of avoiding breakage in the limbs, due to overloading in years of heavy crops, and of greatly reducing the number of culls which would otherwise be handled at harvest time.

"In considering the amount of thinning to be done the fruiting habits of each variety must be carefully consid-

ered, for an understanding of them is of the utmost importance. Varieties like the Newtown and Spitzenberg, that bear many of their fruits in clusters, may be benefited by thinning even when the yield is moderate, because, as has been pointed out, the percentage of culls may be increased quite materially by allowing individual fruits to touch each other. Varieties such as Wine-saps, which naturally are inclined to bear small specimens if allowed to bear a full load, may have the size of their fruits increased materially by judicious thinning. On the other hand, some varieties, such as the King apple and the Clairgeau pear, are apt to grow to a size too large to be best for marketing if thinned considerably. Care must be taken not to thin too heavily or too early on some varieties that shed heavily, such as Arkansas Black. Many varieties that bring low prices on the markets, such as the Ben Davis, it may not pay to thin when prospects are good for large yields of the better sorts.

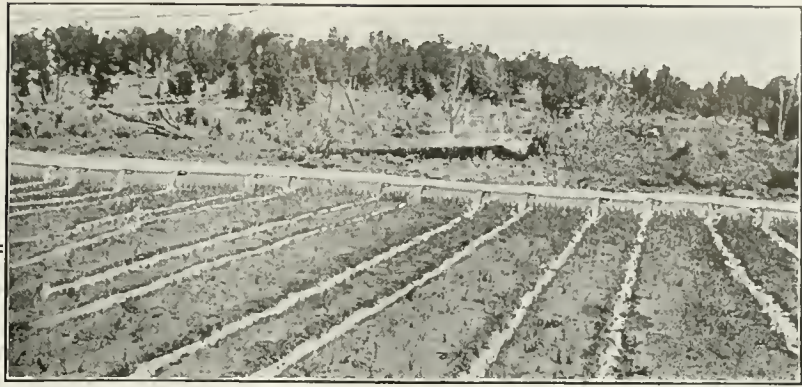
"The cost of thinning will vary greatly with the size and shape of the tree—whether low or high-headed—and the load of fruit it carries. Ordinarily it will take a man from one and one-half to four hours to complete the job on mature trees.

"The best way for every fruit grower to find out whether thinning pays for him or not, is to try it carefully on a few trees, leaving others unthinned to check on. He should keep track of the amount of time required in thinning and in harvesting, and should note the differences in the proportionate amount of culls obtained from the thinned and unthinned trees. After the fruit is sold he can then figure out which method gave him the largest net profit."

Summer Pruning

The importance of summer-pruning young apple trees is little understood by many fruit growers. The habit has become so firmly fixed that all pruning is invariably done during the late winter or early spring months.

While winter pruning will always be most important, because less injury is done to the trees at this season, especially to old bearing trees, yet, for the best success with young trees, summer pruning should be as regularly performed as winter pruning. After the shape of the tree has been obtained through winter pruning, the filling out of the branches and the trunk should be accomplished by summer pruning. This is especially true during the fourth and fifth years after planting. As a rule, most fruit growers prune their young trees too heavily during these years. Growth becomes too excessive, especially in length, and the branches do not become properly braced at the crotches of the tree. If summer pruning is done between the middle and the latter part of June, when the growth in length has reached from twelve to fifteen inches, by cutting off the terminal buds, it will invariably check the growth in length and increase the thickness of the trunk and branches.



The New Era Auto-Irrigator—Works While You Sleep

The thing you have been looking for—something which will distribute your water into furrows with a uniform rate of flow and not require your continued attention. It has been thoroughly tested for two years and its users speak in enthusiastic praise of its work. The more rough and more difficult your land is to irrigate the more the advantages of this irrigating device appear. It consists of a canvas hose with apertures along one side, spaced about 20 inches apart, from which the water escapes into the furrows. These apertures are fitted with a regulating device to regulate or stop the flow of water. The hose is tapering in form to conform to the gradually diminishing volume of water. The standard size is 75 feet long and 6 inches in diameter at large end, and tapers to 1½ inches diameter at small end, which is open. It has a capacity of about one-half cubic foot of water per second when the water in the ditch is raised about 8 inches above the level of the land. This will require that your ditch banks be thrown up a little higher than they generally are at present. The hose is easily and quickly set in operation by connecting it with a pipe set into the ditch bank. The end of pipe in the ditch has a cylindrical screen fitted over it to prevent the entrance of leaves, etc. The hose is light and when one strip of land is irrigated it is easily carried to the next strip. Where more than one hose is needed they can be used in a series, according to the number needed. This device will pay for itself in two months' use or less, besides saving from 20% to 50% in your water and producing better crops by the uniform application of water, and also preventing your land from washing. For fuller details send for descriptive circular. Will make a special discount on the first five irrigators bought and used in any community. We desire implement dealers to sell this great labor and water-saving device in every town, or agents to demonstrate and sell it. Good money for live men. Can be mailed anywhere in the United States by parcel post.

For particulars and prices address

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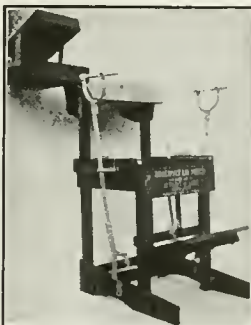
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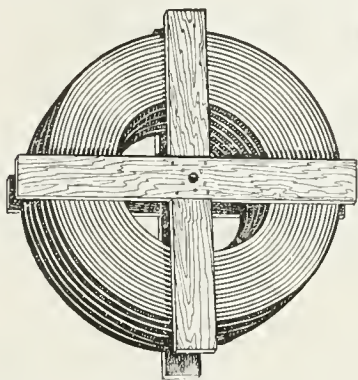
That a Lid Press with nail stripper and cleat box, brackets to hold lids where you want them, cleat hooks to hold cleats while nailing and a perfect treadle ratchet is appreciated by the growers is shown by the sale of hundreds of them to growers not only of the Northwest but of nearly every fruit district of the United States.

Send for circulars and prices to

H. PLATT & SONS, Como, Montana

YAKIMA HARDWARE CO., North Yakima, Washington
PLOUGH HARDWARE CO., Wenatchee, Washington
BERGER & CARTER CO., 504 Mission Street, San Francisco
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Use Peerless Duplex Strapping

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and

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Further, it tends to produce fruit spurs by checking the flow of the sap.

Summer pruning may also be practiced on older or bearing trees in connection with the thinning of the fruit. In this case, there is very little occasion for cutting and pinching off the terminal shoots, as older trees make little or no wood growth, and cutting out a number of fruit spurs will give a larger amount of food supply for the remaining ones and the size of the fruit borne is greatly increased.

In Colorado, especially, we are troubled with over-bearing, that is, most of our trees have too many fruit spurs and set too many fruits, making it difficult to obtain the proper size. While thinning the apples by removing them after the fruit is set is a remedy against over-bearing, yet this is less efficient than the actual removal of a certain number of fruit spurs. In cutting out the fruit spurs they should be cut off close to the branches and in such manner as to leave the remaining spurs well distributed on the branches.

The time for this kind of thinning, or summer pruning, is after the apples are well formed and the June drop is past. The operator can then gauge the number to be removed or left without any difficulty.

A pair of light pruning shears is the best tool for this purpose.—E. P. Sandsten, Colorado Agricultural College, Fort Collins, Colorado.

"Lushus Brand"

The North Pacific Fruit Distributors offered a number of prizes for the best name for a brand, the principal requirement being that the name should appeal to the taste or appetite, this being important for the reason that this was the primary function in the name of any food product. Two thousand five hundred names for brands were submitted. Carl W. Art of Spokane won the first prize, the name "Lushus" being chosen which has been adopted. Mrs. C. A. Sanborn won the second prize with the suggestion "Mello-west." Carl G. Allenbach of Spokane won the third prize with the suggestion "Dependapack." The committee who awarded the prize was composed of Dr. H. S. Clemmer, President of the Spokane Ad Club; G. C. Corbalay, Manager of the Chamber of Commerce, and J. H. Robbins, General Manager of the North Pacific Fruit Distributors.

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Accounts of banks, firms, corporations and individuals solicited. Travelers' checks for sale, and drafts issued available in all countries of Europe.

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Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital	\$100,000.00
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4% Interest Paid in our Savings Department

WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

It was stated early in April that a new warehouse would be erected in Wenatchee this season by G. M. H. Wagner & Sons of Chicago, Fruit & Produce Dealers of that city and large operators in Western box apples. The plans for the warehouse call for hollow-tile construction, fire proof, which will be 50x90 feet, one story with basement. The site selected is at the foot of Orondo Street on a lot owned by Mr. J. Lewis. This warehouse will approximately hold about 50 cars.



WRITE US ABOUT THE
Universal Fruit Sizer and Conveyors
 Most Efficient. Least Expensive. You'd better investigate them.
WESTERN FRUIT GRADER & MFG. CO.
 Grand Junction, Colorado



Marketing the Apple

By J. F. Segrue, Cashmere, Washington

TO attempt to shed any new light on the much discussed topic of marketing our apple crop, is a difficult task. There is, however, an opportunity to point out to those most interested in the solution of this question, the fact, that practical application of some of the plans now in use would be more beneficial to the grower than the constant effort to find new schemes to dabble with.

The marketing of our product under whatever name or form it may ultimately be done, is going to be a complex and many-sided affair, and it is unfortunate that the individual most interested, viz., the grower, is lamentably ignorant of the many difficulties and perplexities that must always be met and overcome in effecting a satisfactory distribution of his crop. The main object to be attained is the getting for the grower the maximum figure that the business can stand. By this I do not mean that the price should be shoved up to an extortionate figure, because then the consumption would be reduced and the business brought to a standstill. Nor do I mean that the fruit should be sold at such a low price as to return no profit to the grower, for in that case the production would cease and the business be brought to a standstill. There is, however, an average price at which consumption can be kept in a healthy condition and at which the careful grower can succeed. The system or systems that for a period of years can bring this condition about is what we are looking for. One of the chief obstacles to this result is the grower himself. The plans to be successful must be elastic. There is no one way in which fruit can be sold year in and year out. There is no one line of effort that can successfully cope with the varying conditions of even any one year.

There are, however, certain broad lines along which the general scheme can and must move to have any hope of success. Supply and demand is the dominating factor. When the supply is great, the demand, while it may not decrease, is necessarily less active and must be sought more diligently. This invariably means a lower price and more expensive selling. In years of short crops the opposite is true. Apples not being a vital necessity, despite assertions to the contrary, are not as badly needed in years of financial stress as wheat, meat, eggs, and the other necessities of life. Therefore, it is only right to expect in seasons such as this that the returns will not be as

glittering as in years of short crops and prosperity, and any plan or plans must naturally be subject to these conditions. The grower in too many instances forgets to take these conditions into consideration, and casts aside or loses faith in the plans already matured, whereas, as a matter of fact, the plan is all right. The grower also has a happy faculty of forgetting that the most perfect plan is doomed beforehand if concerted action on the part of the executive or selling force and the producer is neglected. The sharpest axe in the world will not cut down a tree unless used as it should be. The finest bricks and mortar will not erect a building unless competent labor is employed. Therefore, until the rank and file of the fruit growers study the salient points of any marketing scheme,

and after studying it, apply the knowledge gained thereby in putting the theory into actual practice, little or no result can be expected.

Plans of any kind are not perfected in a day or year. Any selling plan can only be perfected—if indeed that is possible—by years of patient plodding. Stick-to-it-iveness is the great attribute that our business is so sorely in need of. It is generally conceded that a central organization of some kind is the most likely solution of this question. Be it one or two organizations of this nature that is finally decided upon, there is this feature in common to both, to-wit: There must be a central or executive body from which radiates the following spokes: On one side, the canvassers of the trade, call them agents, brokers, what you please, whose duty

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 (EXTRA FANCY)

“RED RIBBON”
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and will also have straight and mixed cars of the earliest Apricots, Prunes, Pears and Peaches grown in the Yakima Valley.

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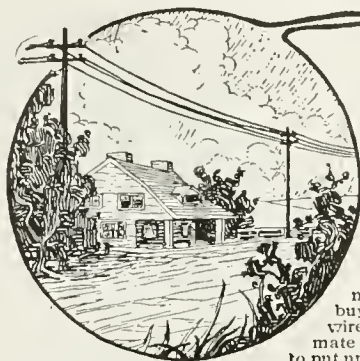
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The line is simple, easy to build

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Especially are these things true, when reliable, made-to-last telephones are used. Each man can buy his own telephone, then decide upon the cost, of wire, poles and supplies. We will tell you the approximate cost, what material is needed and show you how to put up the line free.

Co-operative farm lines are not a new idea. They are being operated in many parts of the world now. Very many thousands of Kellogg telephones are installed today—many in service for eight or ten years in all parts of the United States.

Kellogg Telephones

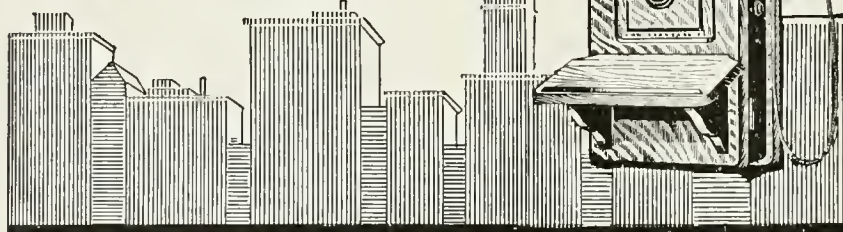
Kellogg farm telephones save you money because they are practical and well built, do not get out of order easily, give unexcelled transmission which means that the bells ring properly, that you can hear and be heard clearly and distinctly.

Ask our practical telephone men at San Francisco for our illustrated bulletins that tell in a plain, understandable way how our telephones operate and why they save money.

We will send you these bulletins and help you build your line in any way that we can. Tell us what you want and the conditions under which you will build your line. Write for bulletin 21.

Kellogg Switchboard and Supply Co.

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We have made a host of friends in California and now come to the orchardists of Oregon, with a proven article, asking a trial. A postal card will bring our literature (without cost) telling you how at a very small expense we have greatly improved conditions both in trees and fruit in many orchards of California.

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it is to find a market for the fruit; on the other side are the local units, composed of the growers who produce the commodity which the agents are attempting to sell. The central body is the halfway house. Being directly in touch with neither the buyer nor the grower, having to trust to the agents on one hand for information as to demand, price, etc., to the grower on the other hand for information as to supply, conditions of fruit, etc., it must be, necessarily, a keeper of records.

When the agent inquires as to the amount and quality of the fruit to be sold, the central body has no actual knowledge of its own. It can only answer truthfully and intelligently as its records are truthful and intelligent. Here is where the grower falls down. He too often fails to realize that telepathy is a negligible quantity as yet, and that unless he personally supplies his union with accurate information, and what is more, sees that those in charge of his affairs in the local are

not only competent but willing to impart that knowledge to the central body, so that they can answer the demands made on them by their agents, he, the grower, is primarily responsible for blocking the track and is seriously handicapping his own business. Another place that the grower fails is the inability of so many of them to realize that some of the individual schemes for selling, while successful on a small scale, would not be adequate to move the whole crop of the Northwest.

A familiar simile might be made by comparing some of these plans to the old story of the man who went into the chicken business. One hen lays one egg every day for 220 days—220 eggs. Two hens lay two eggs every day for 220 days—440 eggs. Ten thousand hens lay 10,000 eggs every day for 220 days a year—10,000x220 eggs per annum. Eggs worth 45 cents per dozen. Result—affluence(?) Exploded theory. It does not work out in actual practice. We who believe in organization do not deery the effort of the individual to make the best bargain he can for his crop, but we do believe that for the ultimate and lasting good of the industry, that man's brains and intelligence would be put to better use if thrown into the common jackpot and used to solve our difficulties in a broader and larger way. If everyone of us was to return to the old ways of individual effort, not one of these plans would be successful, and their success now is based upon the fact that their neighbors are stabilizing conditions and carrying them along as a dead weight at no cost to the independent operator, but at a serious cost to the future success of the business as a whole.

To return to the matter of records. It is absolutely necessary that the central body be kept posted in all the details as to quantity of fruit to be disposed of, condition of fruit at all times, and any other information that the central body may require. These estimates should be sent to the central body as early as possible in the season, in order that the f. o. b. market can be thoroughly combed and supplied. Manifests of cars shipped must be forwarded promptly, so that the traffic department can keep close and intelligent watch on the progress of shipments from loading point to destination. By this means diversions can be accomplished promptly and many advantageous sales made that otherwise would be lost.

Without direct and correct information from the local, the central body has to work more or less in the dark, and therefore, more or less inefficiently. To many individual growers, and to many local units, the persistent demands made on them by the central body seem unnecessary. They are not so. The German army, in the the unfortunate affair that is now taking place in Europe, has proved to the world at large that efficiency in the petty details is worth while. Our position is very much akin to theirs. We are fighting for our existence. We have pitted against us the desire on the part of the

dealer to make as much profit as he can. The public's diversified taste for other fruit commodities, such as oranges, bananas, grapes, etc.; the efforts of the producers of these other articles to supplant us in the public favor; the desire inherent in ourselves to get as much money for as little effort as possible.

The first few obstacles to our success cannot ever be eliminated totally, but the last mentioned, our own weakness, can and must be eradicated. Until we, us growers, realize that it is our business that is being taken care of; until we realize that it is not sufficient to select a theory or plan and lie back in the traces and let the other fellow pull the load, all our attempts to solve the marketing problem will be wasted energy. I once had occasion to discuss local difficulties with one of the members of our union. His complaint was that "they"—meaning the directors—"did not do this," and "they did not do that," and "they did not do the other thing." I endeavored to explain to him that they—the directors—could only advance as far as the membership were willing to advance with them, and that the habit of electing a board once a year and then going back to the ranch and refusing to comply with the rules and regulations adopted by that board was the main cause of failure on the part of so many local organizations. My advice to him was that in the future he would substitute the word "we" for "they," and include himself in the general criticism. So, with the connection between the local and the central or selling body, unless the response is generous, unless the demands made upon the local are promptly responded to, we find forces opposing instead of helping one another. The local that is not up to snuff and that does not obey orders from headquarters is on a par with the mechanic who throws a monkeywrench into a piece of delicate and complicated machinery while in motion.

There is time during the year when a review of the situation by a joint meeting of the heads of the central and locals is invaluable, but during the operating or selling season any hesitation or inefficiency on the part of any branch or unit can only be disastrous to the plan as a whole. There is no plan today that is on record that pre-

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tends to be perfect. My own belief is that there never will be a time that some improvement cannot be effected. I believe, however, that there are sufficient well-grounded theories extant to build on. I would therefore suggest that the great body of apple growers spend more time in mastering the details of the plans now before them, and by practicing, each and every one of you, the principles of sane co-operation, help to advance slowly but surely along the lines as already mapped out. If we would use intelligently and to the fullest extent the means now at our disposal, I believe that our troubles would be materially decreased.

There has been considerable outcry as to the necessity of the marketing heads getting together. If the time of the heads of these agencies was not so

taken up keeping the individual grower in line and instilling into his system the first principles of business, there would be a greater opportunity to progress along those lines. Have you ever seen a horse get his leg over a trace? The horse is young and skittish. The only way to get his leg back is to unhook the trace, but the unfortunate teamster is so busy holding the fool horse by the head that he cannot do the one thing that he knows should be done. So with the apple marketing situation. If the grower would stand still and work for the general good of the industry our difficulties would be minimized.

Remember, at no time, nor under any plan or theory, are all our troubles and drawbacks likely to be removed. We can always look forward to obstacles

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to overcome, vexed questions to solve. Personally, I believe that these trials, like a few fleas on a dog, are good for us. Appledom will never be Lotus land. Intense and keen interest in our business will always be necessary. Individual effort will receive its reward or its punishment in proportion to its deserts. The millenium is a long way off and not likely to be reached in our time. But I do believe that the apple industry, with a portion of the acreage eliminated and a greater portion of the brains and energy that are conected with it diverted into broader channels, can and will be preserved as a business that will be a cause of pride and a source of profit to the Northwest.

Northwestern Fruit Exchange Crop Prospects

United States

Northwest—Wenatchee Valley: Indications point to the following tonnages: Apples, 4,000 to 4,800 cars; pears, 300 to 350 cars; peaches, 150 to 250 cars; apricots, 80 to 100 cars; plums and prunes, in the neighborhood of 25 cars. **Yakima Valley:** Apples, 3,600 to 3,800 cars; pears, 800 to 900 cars; peaches, around 1,000 cars. **Rogue River Valley:** Apples, 300 to 350 cars; pears, 250 to 400 cars. **Hood River District:** The Hood River District appears to be less than a normal year and it is expected that the district will produce from 850 to 900 cars of apples this coming season, with pears running from 50 to 75 cars. **Walla Walla:** 200 to 225 cars of apples. **Spokane:** 300 to 400 cars of apples. **Southern Idaho:** Some reports relative to the apple tonnage this season from Southern Idaho indicate a crop of about 600 cars, while others estimate that the tonnage will come to 1,000 cars or even more, the former estimate, however, being considered more nearly correct. It is expected the output of prunes will amount to about 1,000 cars. For peaches it is expected that some 200 or 250 cars will be shipped. **Montana:** Apples, about 50 cars.

New York—Blossoms were scarce on Baldwins, possibly because of last year's heavy crop. Present indications point to a shortage of about 4,250 cars in the combined peach and apple crops. Peaches will move between August 15 and September 15.

Michigan—A normal crop of early apples is expected, with about a 60 per cent crop of the fall varieties. Peaches considerably above normal. Pears fair.

Georgia—Estimated that 4,000 to 4,500 cars of peaches will move in the period from June 1 to August 25. Last year's shipments totaled 4,020 cars.

Ohio—Estimates of peaches indicate a yield of 2,500 to 3,000 cars, moving from September 1 to 20.

Virginia and West Virginia—This season's apple crop is expected to be light. Virginia is estimated to produce about 1,315,000 barrels. West Virginia will be particularly light.

Connecticut—Huge peach crop ex-



Courtesy of Western Fruit Jobber

Loading Bananas

pected; estimated from 1,500 to 2,000 cars. Ten days earlier than last year.

Nebraska and Iowa—Conditions favorable for large crop of apples, pears and peaches.

Texas, Oklahoma, Arkansas and Missouri—Following peach tonnage estimated from the Southwest: **Texas:** 2,000 cars; early varieties now moving; **Elbertas** to move from June 25 to July 25. **Oklahoma:** About 2,500 cars; July 20 to August 15. **Arkansas and Missouri:** From 2,500 to 3,500 cars, moving from July 20 to August 15. Estimates from the Ozark region for apples are meager, those received merely indicating that the crop is progressing favorably.

Colorado—All fruits greatly damaged by a severe freeze early in May. Indications point to the fact that the Grand Junction district will have but 12 to 15 per cent of a normal crop, although the district around Cañon City (on the Eastern Slope) will produce a large crop. The apple crop for the whole state is estimated to be 3,000 cars; pears 150 to 200 cars; peaches 1,000 cars, the latter moving between August 15 and September 15.

New Mexico—Apple bloom damaged by heavy rains. Crop small, estimated at 200 cars, which is one-half of last year's crop.

California—Pajaro Valley: Apple crop estimated at 75 per cent of 1914 crop. **Sacramento District:** Owing to heavy rains during May cherries were severely damaged, probably to the extent of 50 per cent. This, while not reducing other fruits, nevertheless delayed maturity, particularly of apricots. Indications point to a heavy pear and peach crop, plums slightly less than 1914, apricots about the same as 1914.

Canada

Apples—Estimates for Nova Scotia under date of May 21 indicate a crop of 2,000,000 barrels this season, as compared with 800,000 for 1914. However, fruit is reported being backward and retarded somewhat by frosts, two having occurred in this district during the

week following May 16. Conditions in Ontario and Quebec at this time are reported to be favorable. **British Columbia** on June 15 reported that the crop will run slightly less than last year, the estimated production for the coming season being from 1,100 to 1,200 cars. Old trees are bearing lighter than last year, but which is somewhat offset by new trees coming into bearing.

Pears—In Nova Scotia and Eastern Canada it is expected that the pear crop will be about normal, not differing much in tonnage from the crop of last season. In British Columbia an increase of some 25 per cent is expected over last year, from 50 to 60 cars being expected to move out this season.

Peaches—Peach prospects throughout Canada appear fairly bright. In British Columbia it is expected that the production of all varieties will be equal to, if not slightly greater than, the tonnage of 1914. **Elbertas** are light. Peach movement expected July 20 to October 15.

Plums and Prunes—Will be in heavy tonnage in Eastern Canada if present conditions do not change materially. In Western Ontario particularly a heavy crop of plums and prunes is anticipated; in British Columbia about 100 cars of plums and prunes is looked for.

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Development of Fruit Package

Continued from page 6.

urally the industry has become more greatly developed in some sections of the country than in others, namely, Michigan, Georgia, New Jersey, Delaware, Virginia, etc. In earlier times various sized packages were used in shipping the peach even to the same markets; generally this package was some form of basket. During the later development of the peach industry uniformly sized packages were used in the same market for the same grade of fruit.

For the early peaches a different package was used; there was also a different package used for the extra fancy grades. At one time the best and favorite package was the standard five-eighths bushel basket, without top or cover. For fancy fruit some were covered with muslin, and on others wooden tops were used, being a later idea. This enabled the baskets to be packed without danger to their contents. Another package is the crate of wood, seven-eighths bushel, with two compartments of equal size. These packages were used chiefly for the Baltimore market, where they were popular for some varieties of peaches. Small fancy baskets holding one gallon or six quarts each are generally packed in 32-quart berry crates, which hold either eight one-gallon baskets or six six-quart baskets. These were very commonly used for extra early or extra fancy fruit. In some localities the Delaware half-bushel veneer basket and the Michigan handle basket holding about a peck are largely used, but these have mostly given way to the six-basket or Georgia carrier. A relatively new package which has come upon the market is the Climax, with slatted cover, extensively used as a grape basket. This package has found some favor, as it is attractive and handy to carry home. The peach package generally used in the Pacific Coast states has been the box rather than the basket. The sizes of the boxes used have in the past showed a great difference, but at the present time the favorite package is what is known as the California peach box, which holds less than a half bushel or about 21½ pounds. The peaches packed in this box are nearly always wrapped in paper and stand shipment very well. This package has been a very attractive one and has displayed the fruit well. Within the past season of 1914 quite a bit of interest has been shown by peach shippers and also by receivers on different markets in the bushel basket for packing and shipping fruit. It is declared by many that this package is much more satisfactory to handle than other forms and also that the fruit shows up in better condition when shipped in this container. The big crop now in prospect in Alabama, Georgia, Texas and other Southern states is bringing the subject of packages before the trade and shippers and arrangements are now being made for the handling of the crop.

Growers at different points are discussing the package question. Many prefer to pack in the bushel basket in-

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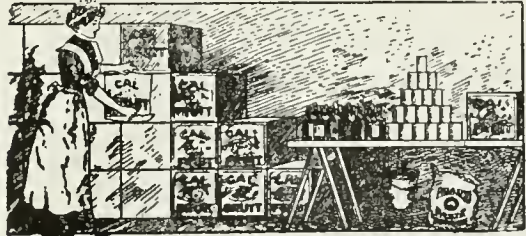
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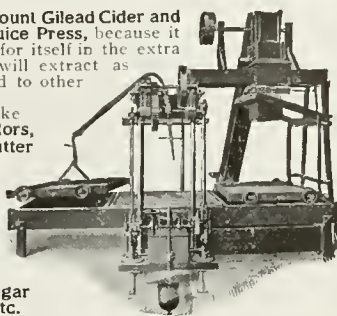
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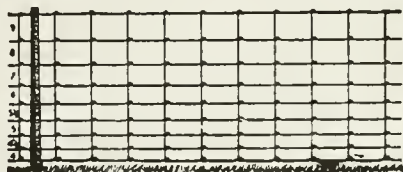
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stead of the six-basket carrier. It seems as though the bushel basket has not until lately been considered safe to ship the fruit in, but with the good results obtained last season it will undoubtedly take the place of the six-basket carrier more and more. The best and most practical way to pack peaches for shipment in bushel baskets to assure them arriving at destination in perfect shape, receivers state, is to nail strips on either side of the car, so that by placing a three-inch board across for each tier a natural shelf is formed which keeps each tier of baskets separate, and protects them from being jammed together by the rocking of the car. In this manner four separate shelves are made running the full length of the car, which will accommodate about 400 bushel baskets. The baskets should be lined with paper and have good strong covers and be made with a pole in the middle to prevent the covers from sinking in and mashing the fruit.

In the Northwest and in California the package used is the California standard box, the dimensions of which are 11¾ by 18¾ by 4, 4½ or 5 inches, inside measurement. Sooner or later this package will probably be replaced by the hushel peach basket, which is proving to be the most economical package in which to handle the peach crop.

The packages used for the marketing of plums seems to vary as widely as the packages used for the other fruits. Very little is known of the past history of the plum package, due to the fact that the plum industry is limited to a few favored districts. There has been but little written in regard to the various packages in which this fruit is marketed. In many of the articles on fruit growing the subject of the package for the plum is dismissed with the statement that the same package is used for the plum as for the peach. This is largely true. Some of the different packages in which fruit is handled are in Vermont. The plum is marketed in both the peck and the half-bushel box. In Massachusetts the round Delaware basket and the old Climax grape basket with slatted cover are used, and to a limited extent they are placed in strawberry baskets in the usual strawberry crates. In New York plums are sold for the most part in Climax, in the six-basket carrier.

The style of the package used in marketing plums varies somewhat with the preference of the different markets. Some prefer the 10-pound handled basket frequently used in marketing grapes, others want the 32-quart berry crate, but the greatest demand of the Eastern markets is for the six-basket carrier used for packing peaches.

In the Northwest the tendency to use a uniform package is much more pronounced than in other sections of the country. The grade rules for the North Pacific Fruit Distributors, season 1914, are as follows: "Prunes and plums should be packed in four-basket prune crates. Fruit too small to pack 6x6 should never be packed in prune crates and should only be shipped in 3½-inch peach boxes paper lined. Whenever

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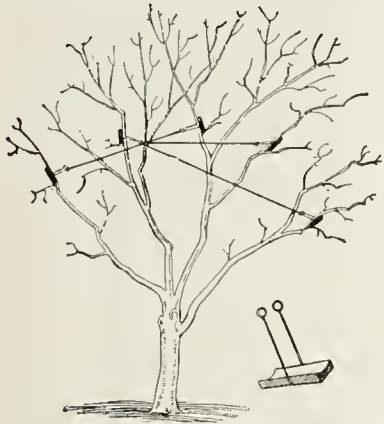
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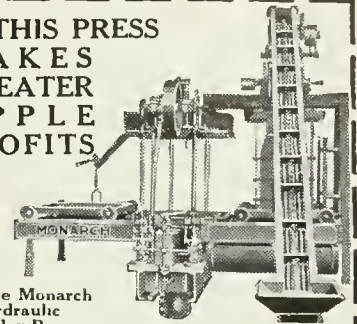
possible use the square pack. Pack all Tragedies and Italians three tiers deep, stem end down; pack top tier with creased side up and all the same way. ttungarians, Bradshaws, peach plums and similar varieties that pack smaller than 5x5 in prune crates should not be packed."

The package which is coming into use and popularity on the markets and among the merchant men is a variation of the four-basket crate that is now on the market. The new package is of two tiers, one above the other, and having two baskets to the tier. This package is very conveniently handled and can be carried with ease, and forms a very desirable "take-home" package, as it can be carried as a suitcase.

The measurements for the Northwest standard plum and prune package are 18½x11½x2½ or 3¾ inches.

In regard to giving any definite size of package for cherries little can be said, as the style of the package used varies widely. A few things which are essential are: A shallow box to avoid weight and consequent bruising; free ventilation; a gentle pressure to prevent jostling; convenience in packing, and an attractive package. In the past the 30-pound cherry box has been widely used, but it is doubtful if this package furnishes sufficient ventilation. Cherries go to market principally in two kinds of packages, either in strawberry boxes and crates, or for the fancy Western cherries boxes varying in capacity from eight to thirty pounds. Many growers say that the 10-pound box is the most handsome package and carries almost as well as any. The Okanogan, Washington, Fruit Union, which ships considerable cherries, has obtained the best results from the use of the 10-pound box, especially for long distance shipping. For short distance shipping the 20-pound box can be used to advantage sometimes, as it costs less money for grocers' trade, where the fruit is weighed out by the pound. For sour cherries a strawberry hallock is used and the cherries are faced on the top of each hallock. The 5-pound tin top box which contains four crates is often used for shipping and has much to recommend it, for it is convenient and gives good ventilation. The ordinary cherry crate which holds twenty-four 1-pound hallocks is also much used; it gives good ventilation and is of convenient size. The hallocks should be a little less in depth than for strawberries. This is probably the package for the cherry that will be used more and more in the future, as it is comparatively cheap, does not have to be packed, and affords an individual package for each purchaser on the market. Another advantage is that if the fruit of any one of these boxes should become damaged it could be removed, and thus the repacking of the whole crate is avoided. As early as 1900 the paper carton holding about one pound of fruit was thought of as an important package for the cherry. This is a very attractive one, especially for a fancy fruit trade. In later years cartons were made of straw

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The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

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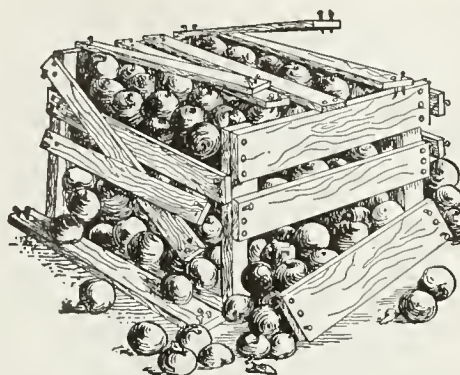
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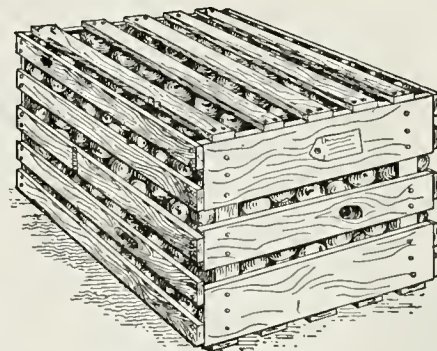
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

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DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles



AFTER use of C. F. & I. Co.'s Cement Coated Nails.

and various other materials, which took well in some of the markets. The main objection to the paper carton is that it lacks in convenience and ventilation. It has not come into general use, as was once hoped for. The whole question of the fruit package for the cherry is unsettled and it will probably be some time before any package will be widely adopted. Some of the dimensions of the package of the cherry are:

10-lb. cherry box— $18\frac{1}{2} \times 9 \times 2\frac{1}{2}$ inches.

20-lb. cherry box— $18\frac{1}{2} \times 11\frac{1}{2} \times 4$ inches.

The California box— $23\frac{1}{4} \times 9 \times 19\frac{3}{4}$; wt. 11 lbs.

We hope to have made fairly clear the progress that has been made up to the present time in the various fruit packages. There still remains a great deal yet to be done before the proper packages are selected. New packages

are constantly being introduced, but most of them are soon discarded. This has not only worked a hardship upon the box manufacturer, but also on the producer and the consumer. At the present time there are entirely too many packages for the same kind of fruit on the market, and any new package introduced should be viewed with suspicion until its merits have been definitely proven; after this there is plenty of time to adopt the package, and much loss would be avoided should the package prove unsuccessful. The different markets have certain types of package that are more acceptable in that market than other packages. The fruit growers raising fruit for some certain market should make a study of the demands of that market and conform as nearly as possible to them. Extra fancy and extra early fruit will probably be continued to be shipped in different kinds of packages than the later fruit, they being more attractive, smaller, and probably more expensive.

The main tendency during the past few years, in the matter of packages, has been uniformity and standardization. This has been a desirable move. The box consumer requires a safe and secure package which will secure delivery of his goods at destination in good order. The size must be sufficient to accommodate the product to be packed therein and must provide for ready packing. The cost of the container must not bear an excessive ratio to the cost of the contents. Containers must be limited in size to conform to easy handling, standard units of measure, and weight of articles per unit of bulk. Standardization will often provide a ready interchangeability of box parts and thereby afford the consumer an advantage. Standardization of boxes prevents waste of lumber and permits manufacture in advance of orders. It insures against faulty packing and guarantees against the loss of commodities through breakage and damage. Uniformity of containers protects the consumer of boxed commodities from false measure and protects packers and shippers from unequal competition resulting from the differences in the quantity of commodities furnished. This is especially a factor for consideration by the fruit trade. It promotes satisfaction and

equality in the trade and eliminates unscrupulous practices.

The necessity for co-operation among the fruit growers in various districts is becoming more and more felt. This movement has and will continue to have considerable influence toward the standardization of the fruit package. In California the California Fruit Growers' Exchange and in the Northwest the Northwest Fruit Distributors have done a great deal toward the standardization of the packages, as they have set forth certain definite rules as to the package specifications of the fruit which they handle.

Any legislation with the idea in view of compelling fruitgrowers to pack their fruit in definite sized packages is doomed to failure. This can be shown by look-

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California is this year holding two great universal Expositions, one at San Francisco and the other at San Diego, in celebration of the completion of the Panama Canal and the joining of the Atlantic and Pacific Oceans. These two Expositions represent an expenditure exceeding one hundred million dollars. To supply the demand for reliable and authentic information on these Expositions and California, we have published two beautiful books; one on San Francisco, the Exposition and Northern California; the other on Los Angeles, San Diego, the Exposition and Southern California; also a lithographed view of San Francisco in colors (size 30×45 inches), a picture of the rebuilt city, including the Exposition. Each book is 6×9 inches, contains nearly 200 pages and many beautiful illustrations.

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ing through the state laws of many states and finding laws which are dead and no attempts have been made to enforce them for many years, they being impracticable. The important point about any legislation would be the matter of quantity and it might be well to say that there is a decided tendency at present time to require a statement on the container of the net contents, stated in terms of weight or numerical count. In fact the new federal law requires on all interstate shipments that the contents be so stated. No provision is made however, as to the shape of the package. One of the greatest dangers in standardizing packages or products is the legislature, as they may pass measures that are impractical for the fruit growers to live up to. Standardization must be simple and legislation must take place only after the public opinion is with you.

The Eternal Question

"What I would like to know," explained the agriculturist patiently, "is what I need in the way of new tools and new buildings and new ideas. Tell me why my wife keeps complaining and telling me she's tired of farm life and wants to move into town? I don't want to go to town."

This isn't a fairy story. It isn't fiction. It isn't even a story about a distant land. It happened in the Middle West, in the East, in the Far West. It's happening today, everywhere.

The agriculturist was up to date. He had a first-class farm. He rotated his crops. He kept the soil fertile. He had good machinery and treated his men well and his livestock well. For the heavy work he had motor-driven machinery. His pumping was done by motor. He had an expensive silo. He kept his roads in good repair. He had quit borrowing money and was investing money instead, most of it in the farm, but a good deal in securities. It was a paying farm.

And yet his wife wasn't satisfied.

The farmer's friend went into the farm house to see what could be the matter. The house was clean and well kept, but the housewife looked tired. In one corner was a sewing machine. The window beside it looked out on the motor-driven pump.

"Where's the motor for that machine?" inquired the friend.

"Motor?" said the farmer; "there isn't any. My wife runs it."

In the laundry were the tubs hanging from the wall, an ironing board, an old range which had passed its period of usefulness as a cookstove and had been exiled to the laundry.

"Ever try washing machines and all the other kinds of laundry machinery?" inquired the friend.

"No," said the farmer. "My wife does that."

"I notice you don't have electric lighting here."

"No," said the farmer after a pause. "Lamps. My wife takes care of them."

The visitor had a lot of comments as he went through the rest of the house.

Ridley, Houlding & Co.

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Points to remember when consigning apples to the London Market

1.—We Specialize in Apples

2.—All Consignments Receive our Personal Attention

3.—The Fruit is Sold by Private Treaty on its Merits

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Every Farmer

is interested in the manifold uses of cement-concrete on the farm.

Practical Cement Work

By W. B. HENRY

is a cloth bound book of 112 pages, giving valuable information on the mixing and placing concrete in the various forms of building.

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European Receivers of American Fruits

Eldest and First-Class House in this Branch

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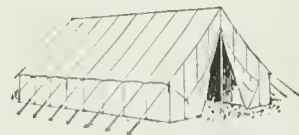
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Special tents to order for housing fruitgrowers' extra help during strawberry and apple picking seasons. Extra large tents to order for apple growers, suitable for storing apples as they come from the orchard; also, suitable for grading machines and apple packers. Weather-proof canvas wagon covers a specialty.



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Our organizations handled 2,500 carloads of Yakima Fruit last season. Hundreds of growers have joined our movement and we already have under contract a much larger proportion of Yakima tonnage than ever before. Additional tonnage is coming to us daily. We have a large proportion of the fruit in the early districts—therefore we can load the early assorted cars—money-makers for the trade and the growers.

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Ground Phosphate Rock is the most economical and profitable and only natural form of Phosphorus to use in systems of Permanent Horticulture and Agriculture, and when properly applied restores Fertility to worn out soils and Maintains and Increases the Fertility of good soils.

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

Then he went outside and pointed to the gasoline vehicles, the motor pump, the utilized water power, the examples of ways in which the up-to-date farmer made machinery do 90 per cent of the work that the men used to do.

"Think it over," he said with a grin. "How much of all your machinery is being used to help your wife? How much better off is she than the farmer's wife of fifty years ago? And think of how much less work you have to do than would have been necessary even twenty years ago. Is it fair?"

At the San Diego Exposition they have a building called the "Home Economy Building," which is calculated to show that drudgery is not necessary; that invention, which has brought about the mechanical speed of farming, has also brought about the mechanical speed of housekeeping. In one section of the Exposition grounds is located the model bungalow which is equipped with motors which operate the kitchen, the laundry, the sewing machine, the cleaning apparatus for floors, windows, walls and furniture. This exhibit does much in the way of showing us how to keep the girl on the farm.

The Cashmere League, Cashmere, Wash., has re-elected the following Board of Directors: Robt. Griffith, Wm. Grigg, Thos. Larson, Frank Shelton, H. G. Bohlke. One hundred and twenty-six members and growers attended the election.

The Fruitgrowers' Wife

Don't waste time scrubbing a sink with scouring powder. The use of kerosene is more efficient and will not hurt the enamel.

A zinc-covered table in the kitchen will save work for the housewife. A zinc cover is easily put on and needs only to be wiped off.

The kitchen should be arranged so as to eliminate unnecessary steps. A very good idea is to have a shelf over a table within easy reach and the utensils that are the most often used hanging underneath, and on the shelf the condiments, salt, etc., and such other materials as are used in cooking.

For those who have electricity in their homes a motor attachment to the sewing machine will do much to simplify the work in the sewing room. There is no work in the world that is so hard on a woman as running the sewing machine, and there are very few fruitgrowers but what can afford to have a motor attachment to the sewing machine.

There are many convenient and economical electric appliances for the house which simplify the work. An inexpensive electric cooking stove is now made that will do much to lessen the work and keep the house cool in summer. In connection with an electric

stove a fireless cooker is very essential and will lessen the fuel bills. Vacuum cleaners are becoming a necessity in the household instead of a luxury. They not only take up the dirt but it is entirely done away with, and if operated by electricity the weekly cleaning day will not be dreaded by the housewife.

Every fruitgrower should see that his wife is provided with a power washing machine. In this way lessen the horrors of wash day, changing "blue Monday" into "sunny Monday." There are many different makes that can be operated by different kinds of power,—hand power, gasoline and electricity. For those who have electricity in their homes an electric washer is the most satisfactory and can be operated for a few cents an hour. An electric iron can be obtained from three to five dollars, which makes ironing much easier and does away with having a fire in the cook stove in warm weather.

Attracting Birds

It is possible with a little care and forethought to attract birds about our dwelling places, adding thereby not only to the cheer, but providing one of the best means of protecting our gardens and orchards from the ravages of insects. One of the easiest birds to attract is the Mountain or Arctic Bluebird, on the east side of the mountains; and the Western Bluebird on the west side. These birds are invited to remain with us not so much by the planting of slow-growing shrubs and vines as by erecting bird houses for them. Even on the treeless prairie this form of invitation will usually induce them to remain throughout the nesting season. Naturally, they nest in holes in trees or cracks in buildings, sometimes in the most unexpected places, states Professor W. T. Shaw, zoologist of the State Experiment Station. I once knew of a pair to nest in the tool box of an old abandoned reaper. Consequently, anything in the form of a box of the proper dimensions, furnished with a hole of sufficient size to admit the bird, will be used by them.

A suitable bird house may be made by converting a small box into one. A box six or eight by ten inches is one of about the right dimensions. In one end, about two inches from the floor, a hole should be made, two and one-quarter inches in diameter. This may be cut flat in the bottom and arched. The box may be made still more attractive, not only to the birds, but to the owner of the place as well, by being covered with strips of bark sawed from yellow pine or fir. The door might be furnished with a little step of sound bark.

The box should be placed at least ten or twelve feet from the ground. It is well to locate it near a building, as under an eave. It may be made to furnish endless enjoyment for the children by placing it close to an upstairs window.—Bulletin 138, Washington State Agricultural Experiment Station.

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CALIFORNIA, OREGON, WASHINGTON, IDAHO AND
FLORIDA FRUITS

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Have ticket read "N. P. Ry."

Ask about Eastbound Summer Tourist Fares

A. D. Charlton, A. G. P. A., Portland, Ore.

The Value of Milk as Food

In the educational exhibits of the Iowa Dairy and Food Department different articles of food are on exhibition and placards stating the cost of each as compared with one quart of milk. In one exhibit the following information was given:

A quart of milk, costing 8 cents, is equal in value to any of the following:

Seven ounces of full-cream cheese costing 9½ cents.

Ten eggs costing 20 cents.

Eleven ounces of fat round beef costing 15 cents.

Fifteen ounces boneless codfish costing 14 cents.

Six and one-half ounces white bread costing 2½ cents.

Five ounces of cornmeal costing 1 cent.

Nine and one-half ounces of potatoes costing 2½ cents.

Four pounds and two ounces of cabbage costing 10 cents.

Five ounces of dried beans costing 2 cents.

Eight oranges costing 23 cents.

One dozen apples costing 9 cents.

Five bananas costing 5 cents.

Six and one-half ounces of prunes costing 6 cents.

Four and one-half ounces of walnuts costing 17 cents.

A few good books that have been issued recently:

"Citrus Fruits," by J. E. Colt, published by MacMillan & Co., New York.

"An American Fruit-Farm," by Francis Newton Thorpe, published by G. P. Putnam's Sons, New York.

"Farm Management," by G. F. Warren, published by MacMillan & Co., New York.

"Manual of Fruit Insects," by Slingerland & Crosby, published by MacMillan & Co., New York.

"Management and Breeding of Horses," by Merritt W. Harner, published by Orange Judd Company, New York.

"Management and Breeding of Sheep," by Thos. Shaw, published by Orange Judd Company, New York.

"California Fruits and How to Grow Them," by E. J. Wickson, published by Pacific Rural Press, San Francisco.

"American Fruit Culturist, 21st Edition," by John J. Thomas, published by Orange Judd Company, New York.

"Fungous Diseases of Plants," by Benj. M. Duggar, published by Ginn & Co., New York.

"The Potato," by Grubb & Guilford, published by Doubleday, Page Co., New York.

"Productive Orchard," by Professor F. C. Sears, published by J. B. Lippincott & Co., Philadelphia.

"The American Peach Orchard," by F. A. Waugh, published by Orange Judd Company, New York.

"How to Make an Orchard in British Columbia," by J. T. Bealby, published by Adam and Chas. Black, London.

"The Work of the Rural School," by Eggleston & Bruere, published by Harper & Bros., New York.

"Insects of Economic Importance," by Glenn W. Herrick, published by Carpenter & Co., Ithaca, New York.

"Key to the Families of North American Insects," by A. L. Melander, Pullman, Washington, and Chas. T. Brues, Harvard University, published by the authors.

A list of publications for fruitgrowers who are engaging in diversified lines:

American Swinherd, Chicago.

Gleanings in Bee Culture, Medina, Ohio.

Kimball's Dairy Farmer, Waterloo, Iowa.

Hoard Dairymen, Ft. Atkinson, Wisconsin.

Northwest Poultry Journal, Salem, Oregon.

Breeders' Gazette, Chicago.

Rural Spirit, Portland.

Angora Journal, Portland.

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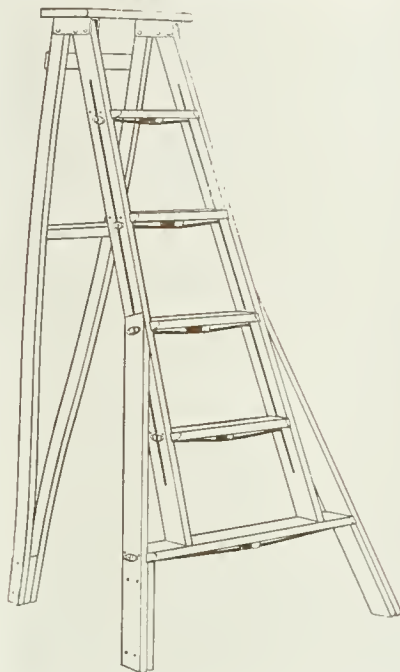


Made of heavy galvanized iron. Has a canvas sack lining with patented opening and closing device. If you like a picking pail you will want a Barnett.

Price, each \$1.50
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Hardie Ladder



Only well seasoned spruce used in its construction, with each step braced. Strong and rigid, it weighs but 8 lbs. to the foot. A thoroughly high grade orchard ladder made in from six to fourteen foot lengths.

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Buildings for the Handling or Storage of Fruit should be designed to afford the greatest possible protection against extremes of weather—hot or cold. Packing Houses should be constructed so as to maintain a uniformly cool temperature in Summer and Fall because the fruit as it comes from the orchard contains a great deal of heat. This heat should be reduced to the minimum before the fruit is packed to insure its reaching the consumer in the best possible condition. The lower the temperature of fruit when packed, the better it will stand up under refrigeration and the longer it will keep in and after cold storage.

To Obtain the Above Results Use Insulation

and apply it according to the specifications of our specialists who have had fourteen years' experience with these problems. They will recommend the use of LITH, LINOFEELT or FIBROFEELT, whichever is best adapted for your requirements, and will send you plans of construction. Our insulation is used in lining the largest cold storage plants and by the leading refrigerator transit railroads. Nearer home we have furnished plans and insulation to C. A. Congdon and the Fruit Growers' Warehouse Company, both of North Yakima, Washington.

Tell us what you want to accomplish and we will show you how it can be done.

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Our Market — The World

BETTER FRUIT

VOLUME X

AUGUST, 1915

NUMBER 2



Courtesy of Southern Pacific Railroad.

Fruit growers are finding that diversity is a big asset in fruit growing. Many orchardists are engaging in dairying, hog raising, truck gardening. Many are finding sheep raising remunerative. The above illustration shows a flock of sheep in the Willamette Valley, one of the fruit growing districts of the Northwest.

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

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Single Copy 10 Cents



\$1,635,000 Hidden

In This Year's Goodyear Tires

Not an Excuse

Let us first explain that this is not an excuse for over-price. Our this year's price reduction — made February 1 — will save Goodyear users about five million dollars this year.

And that was our third reduction in two years, totaling 45 per cent. Our matchless output gives you in Goodyears a value never before known in tires.

Goodyear Extras

Goodyear Fortified Tires have five costly features found in no other tire. They combat your five major troubles in better ways than anyone else attempts.

These tires, in addition, have other features not commonly employed.

If we omitted those extras, this year's probable output would cost us \$1,635,000 less. That is, we could add to our profits about \$5450 per day.

Most of these extras are hidden. Tires that lack them look as strong

as Goodyears. And you would never know it, save by months of use, if we left them out.

\$500,000 Added

This year's improvements—just our latest additions—cost us \$500,000 yearly. Most of it goes into extra rubber — all into extra wear.

And this much is added—this half million dollars—at a time when we save users five million dollars in price. At a time when some makers are skimping to meet competition.

Then our Research Department—to find more betterments still—will cost us \$100,000

Yours for the Asking

These extras are yours for the asking. Tires without them will be offered so long as you will buy them. But any dealer, if you ask him, will supply you Goodyear tires.

Goodyear has for years outsold any other tire. It is gaining new users faster than we can supply them. And those extras did it.

(2416)



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Fortified Tires

Fortified Against

Rim-Cuts—by our No-Rim-Cut feature.

Blowouts—by our "On-Air" cure.

Loose Treads—by many rubber rivets.

Insecurity—by 126 braided piano wires.

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

New Plums and Prunes for the Pacific Northwest

By C. I. Lewis, Chief Division of Horticulture, Oregon Agricultural College, Corvallis, Oregon.

THE material facts in this article were largely obtained through correspondence with successful plum growers of California and of the Pacific Northwest, and some of the principal buyers and handlers of green plums and prunes in the various markets. We all know how successfully plums and prunes are grown in the Pacific Northwest. There are relatively few pests to contend with, and this class of fruit is perhaps grown more easily than any other type of fruit we are producing.

At the present time Western Oregon and Western Washington are producing about thirty million pounds of dried prunes annually. Occasionally a few carloads of green prunes are shipped during those seasons when Idaho has a light crop and there is a general shortage of fresh fruit in Eastern markets. The Champion is being planted somewhat, especially in Western Oregon, and being disposed of largely in such markets as Seattle and Portland, while considerable shipment is being sent to Alaska. In Eastern Washington, in such sections as Yakima and Walla Walla Valleys, and in Oregon, in such regions as The Dalles, Freewater, Milton and Cove, and in Idaho, in such valleys as Payette and Boise, considerable quantity of green prunes and plums are being shipped largely to Eastern markets. In a normal season, Idaho alone will ship eighteen hundred carloads of prunes, chiefly Italian and some Tragedy and Hungarian. Walla Walla reports two hundred and twenty-five cars, but this tonnage will be increased to a thousand cars annually. There are at the present time in the Walla Walla Valley, not counting this year's planting, 31,955 Italian prune trees seven years old or younger. The variety produced in all of these sections is chiefly Italian, with Tragedy and Hungarian increasing. The price at the present time received for Hungarian and Tragedy is greater than that received for Italian, but this condition is probably only temporary, due to the relatively small amount of these prunes. With the increased yield and acreage there will be very little difference in the price between any of the first class shipping plums. In addition to the varieties already named, there are miscellaneous plantings of several plums and a sprinkling here and there of the Japanese varieties. In the vicinity of Portland there are large quantities of plums produced which are handled in a very poor way, and a considerable percentage of the crop is of inferior grade.

The greatest weakness in green prune and plum production in the Northwest at the present time is the fact that the Italian is being planted almost exclusively, and while there will always be splendid markets for this plum, as the Italian probably holds the first place in popularity and in carrying qualities, nevertheless, there seems to be danger that we may specialize too much on this one variety and that we are neglecting other varieties which may succeed fully as well. We know in the

has a wide range of ripening. Such a point as Cove, in Eastern Oregon, is nearly a month later than some of the lower inland valleys. This difference in ripening, however, is a distinct advantage to both sections and gives much less competition.

There is a possibility that some of the plums which grow to such a large size and have such remarkable color in California, will not do equally as well in the Pacific Northwest. Time alone will demonstrate this point. The North Pacific grower, in attempting to handle some of these newer varieties, will have to prune heavily and thin vigorously if he is to get the perfection in size and color. This is especially true of all of the heavy bearers and rank growers. In California there is a great interest being shown in the production of shipping plums. While attending a convention of fruit growers in California last year, the writer was impressed by the fact that no subject treated aroused more interest than the subject of new varieties of plums and prunes for shipping. California growers are vying with each other in producing new varieties of superior excellence. The shipping period in California comes very early. For 1914 the shipping period from the Vacaville district, which is one of the earliest in the state, are as follows: First shipment of Beauty, May 23; Tragedy, May 24; Formosa, May 27; Burbank, May 29; Climax, May 29; Santa Rosa, May 31; California Red, June 5; Gaviota, June 12; California Blue, June 12; Wickson, June 23; Diamond, June 23; Grand Duke, June 25; Hungarian, July 7; Giant, July 13. The season for each variety of plums in this district is about three weeks. One of the best prune and plum authorities of California has kindly prepared for me a table giving the quality, shipping and bearing characteristics of the principal shipping plums and prunes produced in that state, and while these scores would not hold true for all districts, they are, nevertheless, very interesting, showing the keen attention Californians are giving to this business:

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NEW PLUMS AND PRUNES FOR THE
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SPLENDID VARIETY OF FRAN-
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MOVING THE FRUIT GROWER
INTO TOWN

USE OF DYNAMITE ON THE
FARM

Northwest that we must have not only a more diversified horticulture, but in the case of plums and prunes, a more diversified production.

Our plums and prunes are shipping east in very good condition and arrive in European markets. Most of the large Eastern markets will handle this class of fruit as long as it arrives in good condition. In 1912 the earliest plums from the Yakima Valley were shipped about July 26. In 1914 the ripening season came about fifteen days earlier than the season of 1912. In 1913, at Eugene, Oregon, the Santa Rosa ripened August 10, Climax August 13, Burbank August 20, and Wickson September 7. The season of 1914 was about ten days earlier than this. This section of the Willamette Valley reports Santa Rosa and Hungarian as being very promising. The Santa Rosa has been picked, held for two weeks and shipped across the continent in small packages in good condition. While the California season is much earlier than the ripening time in the Pacific Northwest, we will come into competition with them, but their plums are largely out of the way before the Northwestern plums are ready for shipping. The Pacific Northwest

	Quality	Shipping	Bearing
Beauty	100	75 (2)	100
Burbank	50	100	100
Grand Duke	100	100	90
Diamond	100	100	100
California Red	75	75	25
California Blue	100	100	...
Tragedy	100	100	50
Wickson	75	100	50
Giant	75	100	100
Gaviota	75	100	100
Formosa	100	100	75
Hungarian	100	100	50
Climax	90	100	100
Santa Rosa	75	100	100



Courtesy of Southern Pacific Railway

Dairy Cattle, Coquille, Oregon

The California producers are considerably ahead of the Northwestern producers in handling this type of fruit. They have made a closer study of variety characteristics. They give much more attention to thinning, pruning and picking, and their packing is much superior to our own. This is being strongly brought out by reports of some of the marketing districts that receive fruits from both sections. However, these are matters which the intelligent growers of the Northwest can easily master.

It will be interesting to note some of the variety characteristics of the leading shipping plums and prunes produced in California:

Beauty—A new plum which has been fruited but little. However, it is a very promising plum. It will be rather hard to ship unless handled carefully. The tree is a very strong grower, having a willowy type of growth. Probably will be a heavy bearer, even when planted alone, and is thought to be a very good pollinizer.

Burbank—A bright red plum. Very strong grower, requiring severe pruning. Has a tendency to over-bear. There is a feeling in some sections that the Burbank is losing ground.

Grand Duke—A large purple plum. Is a good bearer. Well received in many markets. Is firm, sweet and of pleasing flavor.

Diamond—A purple plum, a very heavy bearer, and universally well spoken of as good grower and bearer. It needs heavy pruning. This plum is distinctively tart, and on that account is very popular. Is one of the most promising for the Northwest to try, and should sell well wherever the Italian is a favorite.

California Red—A light red plum, considered a good shipper, but reported in some districts as being a shy bearer.

California Blue—A comparatively new plum. Shows indication of being

a good bearer, but needs further trials before definite recommendations can be given.

Tragedy—A blue plum. The only one of the European type which tends to be of medium size. Frequently it is a shy bearer. It is very popular, however, on the market.

Wickson—A sharply-pointed plum of dark red color. Makes a rapid upright growth and blooms profusely. Generally sets well, but drops fruit badly during season, often as a result giving a very light yield.

Giant—A large purplish red plum. A very heavy bearer and needs heavy pruning. Competes somewhat with Hungarian, but doesn't meet with quite as good reception on the whole as does the Hungarian.

Gaviota—A fine large plum. Its bearing qualities in some districts, however, is doubtful. Has a very thick skin, small pit, is quite shapely, a strong grower, and thought by some to dry satisfactorily. Some sections report its bearing very favorably.

Formosa—A large red plum. One of the very best early. Makes an upright growth and occasionally blossoms lightly but sets well. Needs heavy pruning. Is extremely promising for the Pacific Northwest.

Hungarian—A large red plum which needs very little comment in the Northwest. Is locally known as Pond's Seedling. Should not be confused with Hungarian Prune, which is a large blue fruit.

Climax—A dark red plum. One of the very best early, but not as good as Formosa in quality, and is apt to crack at blossom end. The tree makes a small wiry growth. Requires heavy pruning, as it sets and bears well.

Santa Rosa—A red plum which grows much like the Gaviota. The flesh is also a little tinged with red. A heavy bearer, needing severe pruning. One

of the most promising for the Pacific Northwest.

Champion—A dark purple plum, grown especially near Salem. Has a rather peculiar form, being compressed on the side. Is very firm, a good shipper and considerably earlier than Italian.

The following plums are either Japanese or Japanese hybrids, and are large, sweet plums, generally red in color: Beauty, Burbank, Wickson, Gaviota, Formosa, Climax, Santa Rosa. The so-called European varieties are considered superior in quality, larger in size, and most of the varieties are blue or purple, there being a few red, however. The following are varieties of the European type: Grand Duke, Italian, Hungarian, Tragedy, Giant, California Red, California Blue.

Our readers will be interested in knowing the market opinion of some of these varieties:

One New York firm stated that the most popular varieties in that market are: Tragedy, Hungarian, Burbank, Diamond, Wickson, Grand Duke, Santa Rosa and Italian. The Splendor, a new variety from California, is also highly spoken of. The bulk of the California fruit arrives early in July and August. The Pacific Northwest Italian prunes are being exported very successfully to England. A second firm reports that 75 per cent of the Northwestern fresh fruit goes to the great East Side, known as the Ghetto, and that this section will buy almost unlimited quantity as long as the prices are cheap.

A Chicago house states that other than Italians our plums are apt to be too small, and that the latter part of the season some of the Northwestern prunes arrive in very poor condition, showing considerable blister, mold and decay. Another firm believes the banana is bound to push harder and harder on the soft deciduous fruits. This is due to the cheapness in price. The Italian, Hungarian and Grand Duke are preferred from the Northwest.

In Philadelphia, Burbank, Grand Duke, Tragedy, Wickson, Giant, Formosa, Hungarian, Climax, Diamond, Santa Rosa, Italian, are popular.

In St. Louis one firm states that the city can handle fifteen carloads of Italian a week and maintain present prices. Could handle more provided prices were lowered. The Italian and Hungarian are preferred, but some Tragedy can be handled. However, they do not want the French from the Northwest. Popular California varieties are: Grand Duke, Burbank, Wickson, Tragedy, Giant, Hungarian, Diamond. This firm also reports that during the latter part of the season considerable of the Northwestern fruit gets very moldy.

Milwaukee—The Italian from the Northwest are well liked when they can wholesale at 75 cents a crate, which means a retail price of 25 cents a basket. The most popular varieties are: Tragedy, Italian, German, Climax, Santa Rosa, Grand Duke, Diamond, Hungarian, California Red, Clyman. California fruit is received in eight days; Northwestern in nine. Fruit shipped in

P. F. E. and S. F. R. D. refrigerator cars carry better than fruit in refrigerator cars coming from the Northwest.

Minneapolis—Do not like Clyman and Petite. Not familiar with Earliana, Gaviota and Champion. The other varieties described in this report are popular in this city.

Washington, D. C.—Not handling Northwestern plums and prunes, city being supplied largely by local fruits grown in nearby states.

Topeka, Kansas—Burbank, Grand Duke, Tragedy, Wickson and Diamond of California, and Italian, from the Northwest, are favorites.

Lincoln, Nebraska—Not receiving all the Italian that can be used. Could handle 50 per cent more fruit if prices were 25 to 35 cents a crate lower. Varieties preferred are: Burbank, Grand Duke, Tragedy, Wickson, Giant, Hungarian, Diamond, Santa Rosa and Italian. In early season trade likes red Japanese varieties; later prefers blue fruits.

Columbus, Ohio—The old-fashioned damson, Shropshire damson, French and Italian are preferred. This market doesn't take kindly to extremely large plums regardless of color. The Tragedy, Burbank and Champion have some demand.

Kansas City, Missouri—This city depends upon the Pacific Coast for its supply of plums, the Italian being about the only one handled from the Pacific Northwest. Occasionally varieties like Giant, Climax and Hungarian sell well. It is believed that the amount could be materially increased by shipping to territory adjacent to Kansas City, especially Oklahoma and Nebraska. California varieties meeting with favor are: Grand Duke, Tragedy, Wickson, Giant, Champion, Diamond, Santa Rosa.

Evansville, Indiana—Can use limited quantity of Italian and occasionally mixed cars of such varieties as Burbank, Grand Duke, Tragedy, Wickson, Giant, Hungarian, Climax and Clyman.

Dallas, Texas—Do not use large quantities of plums and prunes, a few being received from California with mixed cars of grapes. The blue plum is not a good seller in this market. Have never been successful in selling Northwestern plums. Red and yellow fruit sells better in this market.

Houston, Texas—Receive local supply in June, July and part of August. After that shipments of Burbank, Grand Duke, Tragedy, Wickson, Giant, Hungarian, Climax, Diamond, Clyman and Italian are handled. Some of the Northwestern plums tend to run too small in size.

Detroit, Michigan—The only varieties handled from the Northwest are the Italian and German, which always find a good market. Much local fruit from Michigan is handled. Such California varieties as Burbank, Grand Duke, Champion, Tragedy and Gaviota, are well received.

Tucson, Arizona—Most of the fruits come in mixed cars from Los Angeles. Are handling Grand Duke, Tragedy, Burbank, Gaviota, Wickson and Hungarian.



Courtesy Western Fruit Jobber

Fruit Jobbers and Their Wives Enjoying a Visit to a Banana Plantation in Midwinter

New Haven, Connecticut—Fruit begins arriving in June and continues until the middle of September. Fruit arrives in very good condition from the Northwest. Varieties being sold in city are: Climax, Burbank, Italian, Grand Duke, Tragedy, Wickson, Gaviota, Hungarian and Diamond.

Pittsburg—Most of the fruit comes from California. Varieties handled in largest quantity are: Clyman, Tragedy, Climax, Burbank, Abundance, Santa Rosa, Red June, California Red, Wickson, Diamond, Grand Duke, Sugar, Giant and Hungarian. The California fruit is systematically and well handled. Some Northwestern fruit received when California fruit is cleaned up.

Birmingham, Alabama—Popular varieties for this market are Burbank, Tragedy, Wickson and Hungarian. Most of the fruit received comes from California.

Portland—City over supplied with local stuff, largely in bulk. Some of the better grades of Burbank, Tragedy, Wickson, Climax, Santa Rosa and Clyman are handled.

Seattle—City favors Climax, Burbank, Tragedy, Hungarian, Clyman, Italian and Peach. Received a new package the past year, which they prefer. This is one basket wide, two baskets long and two baskets deep, one basket being packed on top of another, with a deck or board between.

San Francisco—Beauty, Santa Rosa, Climax, Diamond, Tragedy, Wickson, Grand Duke, Grosse, German, are preferred varieties. Second choice are: Sugar, Giant, Satsuma, Kelsey, Burbank, Clyman. Local fruit arrives from May to August. Could use considerably through August, September and October.

All markets, with the exception of Seattle, report uniformly that the present four-basket crate is a very desirable package, and it is doubtful if it can be improved upon.

Special Recommendations for the Pacific Northwest

The Italian prune is the most popular shipping prune, not only in the entire Northwest, but for the Pacific Coast.

The Hungarian, Tragedy and Champion are at the present time selling for higher prices than the Italian, owing to the under-supply of these varieties. So far, these are the only varieties we have been shipping from the Northwest successfully in commercial quantities.

The Northwest should not attempt to ship Petite prunes in the fresh state, or any plums or prunes that are small in size or of poor color.

The acreage of the Italian will increase materially in the next ten years, and it is probable that the prices will be lowered for this variety unless special attention is given to distributing it to new markets.

Since plums can be sold as long as they are good, it would seem that the Northwest should attempt to grow more varieties and lengthen the ripening season.

We would suggest that in each valley where green prunes and plums are a commercial crop that the following additional varieties be tried in a limited way: Beauty, Burbank, Grand Duke, Diamond, California Red, California Blue, Wickson, Giant, Gaviota, Formosa, Climax, Santa Rosa, Splendor, Earliana. While some of these varieties may not succeed as well as in California, on the other hand, some may excel California in excellence.

In attempting to grow most of these plums, especially the Japanese varieties, which tend to bear heavy and produce vigorous wood growth, it will be necessary for our growers to prune more vigorously and practice severe hand thinning.

The Northwest should be more careful in handling and packing the green prunes and plums.

The Apple as a Farm Product—History and Present Status

By A. Millard, Jr., Hood River, Oregon.

(Continued from July edition)

CHAPTER FIVE

HOW MANY APPLES—OVERPRODUCTION

THE writer has been told on many occasions by various good business men, some of whom were farmers, to "keep out of the apple game—there will be overproduction." In the general sense that this term is taken it would seem from all points of view that this is indeed to be the case. However, without explanation, the admission of overproduction is sure to be misleading, and when it comes to the blanket advice to keep out of the apple game, it is indeed another question entirely. We will, therefore, at this point qualify and define this overproduction.

First, as to the subject of cycles of prices and plantings. G. F. Warren, in "Farm Management," says: "Man is so constituted that he is too likely to think that the present conditions are to continue. If we have a wet year or two, we think that it will always be wet; if good prices, these are to remain forever. In the case of prices, it is the very feeling of certainty that present conditions are to continue that makes it impossible for them to do so." Farmers, to some degree, and near-farmers to a much more marked degree, are prone, in determining what crops and animals to produce, to select those which have been high for the last year or two. The fallacy of this appears with consideration of price range over a considerable period, showing temporary inclines and declines that have no real indicative value. Further, it must be considered in regard to the total amount produced, that the weather for any particular year is almost as important as the acreage at that time. The annual crop tends to be much less out of adjustment to the demand than longer time crops for obvious reasons. To quote Professor Warren again: "The longer the time required to grow a product, the worse the periods of over and under-production become." Curves have been constructed to show the cyclic nature of prices with several products, and the result is very striking. The period for hogs is three years of high prices and three years at low—a six-year cycle—and graphed prices since 1867 show true cycles which only vary occasionally with a very large corn crop, etc. The writer believes Professor Warren to be the most logical thinker of prominence in agriculture today, and as to the cyclic nature of farm production, there can hardly be any question, but the case for each indi-

vidual or for each community is affected by many other factors.

From 1854 to 1864, apple prices were high, and from 1865 to 1874 they were very high, and continued at about this level until 1878, when the down slope of the curve was reached. Prices dropped quite steadily, more rapidly at first, till 1896, the year of the famous bumper apple crop. Since 1896, the prices have been rising steadily till the present. 1912 was a bad year, and 1914 has been a very bad year, and it rather appears that the approach of the down turn is at hand. This should be well under way about 1920, according to the cycle hypothesis. (See Appendix, Table 31.)

In Parma Township, Monroe County, New York, in 1912, 5.7 per cent of the apple trees were planted between 1859 and 1878, and only 11 per cent from 1879 to 1903, while 21 per cent were planted in the five years 1904 to 1908. (M. C. Burritt, Thesis, Cornell University Library.) In 1908, 6 per cent of the apple crop of this country was borne on trees planted since 1878, and since practically no trees were planted after this period till 1903, we may expect high prices in some years until the recent plantings fully affect production, and then large crops and low prices should prevail for a period of about twenty years. Professor Warren estimates that the plantings will affect prices about 1920 or 1925, but this estimate was made before the size of the last three crops, 1912, 1913 and 1914, and of these three, the first and last certainly point to an earlier Waterloo than Professor Warren anticipated.

The writer is convinced of the general soundness of the overproduction bugaboo in apples, but, at the same time, he fails to see this as complete discouragement to the present, or even the prospective apple grower. We should remember that weather is almost as potent a factor in the production of a given year as is the bearing acreage; farmers expect good and bad years with any crop, and most so with a biennial crop. A very progressive North Pacific grower has told the writer that he could do very well on a 1913 year once in three of four years, and 1913 was only a fair to good year for Western apples. A good many men will engage in the production of apples and they will make some sort of profit or they would cease to raise the fruit until the scarcity had brought the price up to a point where they could produce at a profit. The question for each grower and each community is: Who is going to raise the apples? They must be raised, 100,000,000 to 300,000,000 bushels a year, and competition of a very harsh sort will decide.

We have, above, covered in a way the question of high or low prices to come, but it will be well to attempt to settle this question from a slightly different angle. The following table may prove enlightening in the question

of comparative high prices of apples. It will be noted that apples have increased in price in nothing like proportion to other staple food products.

TABLE VII.—COMPARATIVE INCREASE IN PRICE OF APPLES AND OTHER CROPS

Apples	9.5%	Oats	37.7%
Cotton	61.1%	Potatoes	28.2%
Corn	11.9%	Wheat	36.5%
Hay	33.4%		

Prices must be higher or lower; they cannot remain at a medium level under the pressure of the capital involved. This capital is pretty well lost unless some return is obtained for apples, and it stands to reason that this capital will produce apples at a very low return rather than to mark itself out as a dead loss. We can start with the perfectly fair assumption of the existence at present and of the future "coming in" of further supply of more than enough trees to meet the demand for apples in any but small-crop years. As to the alternatives of high and low prices—if prices should show any prospect of being good, the farmers will crop (spray, etc.) more than enough apples to supply the demand at high prices, and the prices consequently will drop. Apples will be marketed as long as the farmer can get anything over his total cost of production, and in bad years fruit will be marketed below the cost of production, for once raised, the farmer must get what he can for his product. We have then a pressure of supply which will assure against higher than bare profit market prices in normal years. This pressure of supply will accomplish much in the lowering of the cost of production, considering production as taking the fruit clear to the consumer. Economic necessity, and this alone, may and doubtless will, alter the machinery of distribution, and here are involved several important factors which vitally affect our future prices. The chief of these is increased consumption with lower prices. This subject is best discussed elsewhere. It is safe to say that producers in general will receive in normal years what they now consider bad apple year prices, and that the man who eats apples will pay less for them.

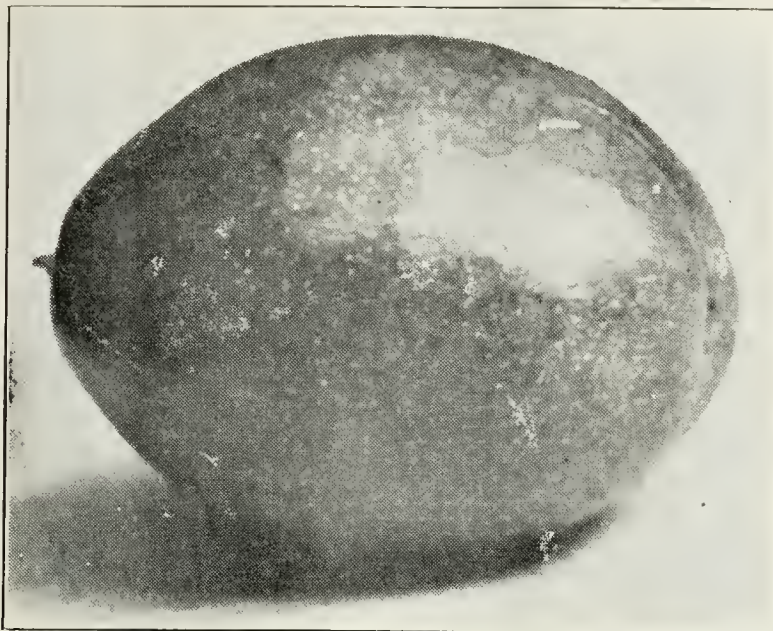
What, then, is to be the fate of the existing plantings of apples? Unfortunately, just the sort of statistics on plantings which would be most useful in this discussion, are not available. Figures on bearing and non-bearing plantings over a long period of years, and figures on annual plantings would do much to clear up this matter. However, census figures and figures from other sources can be of the greatest assistance if studied intelligently, and we will, below, consider several tables on plantings and production.

The following figures on the production of apples since 1896 are the best that the writer knows of. The figures are rather conservative, generally below census or government figures, and

Continued on page 27

Wanted

A position as superintendent or manager of a fruit farm by a graduate in horticulture from Kansas Agricultural College. Was raised on a farm and since graduating from college have spent three years in orchard work as foreman and manager. Can furnish best of recommendations. WM. R. CURRY, Dixon, Mo.



Franquette Walnut, actual size, grown on farm of J. H. Wheeler, Zinfandel, Calif.

Splendid Variety of Franquette Walnuts

[From the St. Helena, California, Star]

ONE of the largest and most interesting farms among the many productive ones in Napa Valley is that owned by John H. Wheeler, at Zinfandel, near St. Helena.

On this splendid estate will be found a large vineyard and well equipped winery, a thriving prune orchard, a sufficient number of acres of alfalfa to support a fine dairy herd and sleek bunch of hogs, and such a diversity of things that the visitor is at once impressed with the wisdom of its owner in not putting all his eggs in one basket. At Mr. Wheeler's place will be found, therefore, diversified farming carried on scientifically and with gratifying results.

But the feature of the Wheeler farm that impresses one most and is just now attracting widespread attention, is the grove of 140 acres of walnuts, now coming into bearing. About two tons of nuts were marketed at a fancy price this week, and each year from now on the yield will be larger until, when the trees have attained an age of ten years and have come into full bearing, it is confidently expected that there will be harvested annually from this one walnut grove a ton of nuts to the acre, or a total of 140 tons.

Walnut growing in Napa Valley, as an industry, is new, and consequently interesting from that viewpoint, but growers and others interested in walnuts are probably most impressed by the variety Mr. Wheeler has selected and that predominates in his grove.

After very wide investigation, Mr. Wheeler selected the Franquette as the best variety for this valley, and, in fact, it has taken the lead in California, because of the large size and splendid quality of the nut.

The Franquette walnut has easily taken the lead in grafted and budded stock in California. The nuts are eagerly sought by dealers and command a premium of several cents per pound over all others.

The variety was first brought to California by the California Nursery Company in early days, from the Grenoble district in France, where it developed from a century or more of breeding up in a climate much more severe than ours. It comes out a month later and sheds its foliage several weeks earlier than the Concord and Santa Barbara varieties, though the nuts ripen later.

Grafted by all leading nurseries onto California Black stock, the Franquette seems best qualified for all requirements of the central and northern part of the state, where it is blight proof.

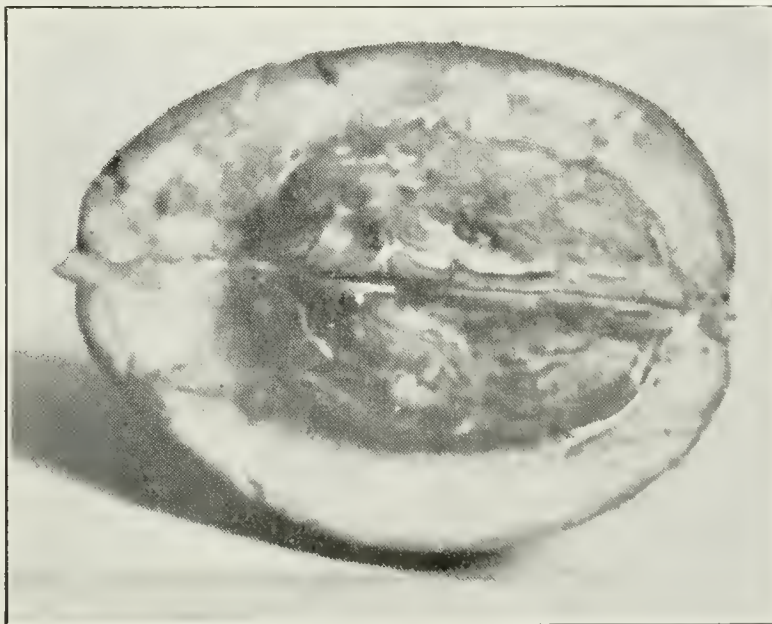
Many seedlings have resulted from its wide distribution, some of which show marked improvement over the original European stock. One strain, the exact life size of which appears in the illustrations that accompany this article, represents an extreme variation selected by Mr. Wheeler as his specialty. It is a veritable "whale" among walnuts, weighing five ounces and measuring eight inches around one way and eight and three-quarters the other. This weight and the measurements, of course, include the shuck, but the nut itself is exceptionally large, is full of white meat, and has a light, firm shell.

The Franquette is wonderfully prolific when on trees old enough to bear, though not so precocious as some others. Mr. Wheeler grafts his California black walnut stock to this strain of Franquette only, and his product has attracted wide attention, excelling all others thus far produced in the state.

Some have objected to other Franquettes for their shy-bearing qualities. The strain in Mr. Wheeler's grove is certainly an exception, for the mature trees yield crops difficult to maintain without placing props under the trees. Mr. Wheeler lost three nine-year-old trees this year from breaking under their heavy loads.

The shucks of this strain, like all Franquettes, are remarkably heavy, so much so that they may be utilized separately for making valuable walnut pickles, if the nut be picked and removed therefrom at early maturity. The pickle somewhat resembles the olive, and is very palatable, being considered a great delicacy by many.

Mr. Wheeler has saved several hundred pounds of nuts of this year's crop, and these will form an attractive fea-



Same Nut cut through center, showing how thoroughly meat fills the shell



SPEED YOUR SALES



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Our experts on fruit packing will advise you free of charge.

WRITE NEAREST OFFICE

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Los Angeles Fresno Portland Seattle Salt Lake City

ture in Napa County's exhibit at the Panama-Pacific Exposition.

From the very start the entire prunings of this Franquette stock have been eagerly bought by prominent planters and nurserymen, and thus they are being distributed over the state and Napa County in particular, where the industry bids fair to assume very large proportions. Certainly California growers of walnuts are to be congratulated on getting well started on such a marvelous producer. By such selection this state must ultimately outdo Europe in the production of walnuts, just as we have outdone Spain in the production of raisins and some other products.

When Mr. Wheeler decided to go extensively into walnut growing, he made a close study of every phase of the industry. His son, Rollo C. Wheeler, also became greatly interested, and the two visited all the large groves in the state and studied every available authority. Now that a large acreage of the trees are coming into full bearing a visitor will find every preparation made for caring for the crop.

Near the winery is a building 80 feet long, one half 30 feet wide and the other half 16 feet wide, the whole being 26 feet high. This is equipped with every modern device for handling the nuts, which are washed, sorted, dried and bleached. There are six tiers of wire mesh tilting drying trays, each of one ton capacity. These are arranged to dump automatically, and thus the nuts drop from one tray to the other in the process of drying. The plant has a capacity of 50 tons, and was installed by C. C. Sidwell, of Los Angeles, an expert in that line.

As the walnut industry has developed during the past few years, there have been many visitors drawn to Zinfandel

to inspect Mr. Wheeler's grove and plant.

When walnut trees come into bearing the nuts may be handled at light expense and command good prices; thus, it is safe to predict that Mr. Wheeler will soon find that branch of his varied farm work the most profitable and desirable of all the activities at Zinfandel.

Use the Garden Hose on Insects

Where city water pressure is available, the garden hose often affords the easiest way of checking the ravages of certain insects, states Dr. A. L. Melander, Entomologist of the Washington Experiment Station. Many people have the idea that strong poisons are required in controlling bugs, but this is not necessarily so. A stream of water delivered through a garden hose will most effectively serve in washing off and maiming such insects as aphids or plant lice, leaf hoppers, red spiders, young scale insects, the elm-bark louse, the cottony maple scale, caterpillars, slugs, bud-worm, as well as spores of fungus diseases that have found lodgment on the plants. Not only is this treatment serviceable, but in many cases it will give better results than can be had by insecticides applied by the small spray pump. The use of certain sprays about houses is often attended by staining of painted woodwork or by the persistence of disagreeable odors, which are obviated by the water cure. Even under some garden or orchard conditions, where water piped under pressure is not available, it may be most advantageous to combat certain insects with plain water applied in this case by a pressure spray pump through a plain-bored nozzle. Red spiders, currant worms and aphids call for such a recommendation, especially just before the fruit is to be picked, when spray

compounds might leave a taint. When aphids have curled the leaves they cannot be reached by the usual spraying but they must be touched by the poison to be killed. A stream of water is much more likely to wash out the aphids family from curled leaves than a misty spray is to penetrate into their midst. Many of these insects obtain their food by sucking, and sit with their beak deeply inserted into the plant tissue. When struck with a forceful stream the beak is cracked, and such insects, even if not killed outright, are unable to feed again. City shade trees besmeared with honey-dew from aphids moreover receive an advantageous cleaning from the hosing.—Washington State Agricultural College Bulletin.

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A Few Valuable Fruit Receipts

By Miss Helen A. Syman, Pittsfield, Massachusetts

Grape Blanc Mange.—Take one-half cup of grape juice which has been sweetened to taste. When boiling stir in two teaspoonfuls of cornstarch, blended with one tablespoonful of water. Let boil about five minutes, then pour into a pretty mould, a cup will do. The mould should be rinsed in cold water. Turn out on a saucer and place whipped cream around it. Any kind of fruit juice may be added.

Plum Sweetmeats.—When damson plums are ripe, peel and divide them, taking out the stones; put them over a gentle heat to cook in their own juice; when soft rub them through a sieve and return to the stove, adding just enough sugar to sweeten, a little cinnamon, and when nearly done add wine in quantity to suit the taste. This is done for the flavor. If sealing cans cannot be had, paste over with white of eggs on top.

Compote of Pears with Maraschino.—One pint of stewed pears; drain syrup into a saucepan and arrange the pears on a dish. Add one ounce of sugar, a

tablespoon of maraschino and a vanilla bean to the syrup; let simmer on fire to one-half the quantity; then strain the syrup over the pears and serve.

Cherry Tapioca.—Let stand over night one cup of pearl tapioca in cold water; in morning put in double-boiler and add one pint of boiling water; let it cook until clear, then add the juice of one lemon and one-half cup of sugar and one pint of stoned cherries; pour into a mold, set on ice to get good and cold. When ready to serve, unmold and serve with whipped cream flavored with lemon extract.

Queen's Pears.—Select small, hard pears, not too ripe, and boil until they can be pierced with a straw, in water enough to cover. For every six pears add one large cupful of brown sugar and one-fourth of a cupful of New Orleans molasses. Boil until the syrup is thick and stiff. Chill in the ice-box over night. Dissolve in three cupfuls of cold water one and a half cupfuls of white sugar, add tablespoonful of mixed spice; in this boil rice until tender; press the rice into small molds, chill and arrange upon a platter. Place a pear on each mould of rice and cover with syrup. Serve with cream.

Pineapple Cream.—One grated pineapple, two eggs, one cup of sugar; put in a double-boiler; when it boils put in a tablespoonful of flour wet with a little water; cook until it thickens;

when cold pour over it one-half pint of whipped cream.

Peach Pudding.—Mix one cupful of sponge cake crumbs in one quart of milk, add one-half cupful of sugar, the well-beaten yolks of three eggs and the stiffly-whipped whites of two eggs; mix well and bake until firm in center. Spread over the tops a thick layer of pared and thinly-sliced peaches and cover with whites of two eggs whipped to a very stiff froth with two table-spoonfuls of powdered sugar. Return to the oven with the door half open and leave until the meringue is a pale straw color. This is very nice and delicious.

Bavarian Cream with Peaches.—Cut peaches in bits and boil with enough sugar to sweeten them. When soft rub through a colander. Then add a half box of gelatine and one cupful of cream. Stir well and when it begins to set add one pint of whipped cream, previously prepared. Pour over mold and put on ice. Serve garnished with peaches cut in halves.

Peach Sherbert.—Melt one-half of a pound of sugar in a quart of water and cook twelve peaches in this syrup until tender. Mash the fruit fine. Soak a level teaspoonful of gelatine in cold water and dissolve it over heat. Add

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the prepared gelatine, with the juice of one large lemon, to the peaches, and cool the mixture well before freezing.

Peach Compote.—To make a compote of peaches, cut the pared fruit in half and put in a saucepan with four tablespoonfuls of sugar. Let them get heated through. Put each half peach on a square of sponge cake, hollow side up. Moisten one tablespoonful of corn-starch with cold water, adding two teaspoonfuls of lemon juice and one egg very lightly whipped, mixing with the peach syrup, and let all boil together for a few minutes. When slightly cool pour over peaches and put in cold place. The syrup will jelly all about the fruit. Garnish with whipped cream and candied cherries.

Peach Shortcake.—Make a shortcake dough by sifting together one quart of sifted flour, three teaspoonfuls of baking powder and half a teaspoonful of salt. Rub in half a cupful of butter, add the beaten yolks of two eggs and just enough milk to make a soft dough. Bake in rather a deep pan in a hot oven. When done, split with a hot knife, butter quickly and spread with sweetened peaches. The peaches should be cut up in rather small pieces, prepared before the cake is baked. Place the other crust on top, spread more peaches over it, and serve with whipped cream.

Peach Pie.—Bake a rich tart and when cool fill it with sliced peaches, sprinkling a little sugar over each layer. Over the top of these spread a covering of whipped cream, sweetened and flavored with lemon. In place of the cream a meringue may be spread on and browned in oven. Use whites of two eggs and powdered sugar for this meringue.

North Pacific Fruit Distributor Appointments

Mr. E. W. Jones has been appointed district manager of our Chicago office. Mr. Jones will have general charge of all of our business in the Chicago territory, including everything from the Twin Cities as far East as Pittsburgh, Philadelphia and New York, in which territory he has had wide business experience in all lines of deciduous fruits.

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ALBERT BETTENS, Manager

Since 1913 Mr. Jones has been in the brokerage business at Kansas City, closing out his business to accept the Chicago appointment. In 1903 Mr. Jones joined the sales force of the California Fruit Distributors and was appointed sales manager in 1906, and later assistant general manager, during which time he was in intimate and personal touch with all of the fruit consuming centers in the United States and Canada, where he has a personal acquaintance with both the trade and their fruit requirements.

Mr. Jones is now making a visit to the fruit producing sections of the Northwest, and will shortly leave for his new headquarters in Chicago.

Mr. C. W. McCullagh, for the past three years connected with the Yakima Valley Fruit Growers' Association, a sub-central of the North Pacific Fruit Distributors, in the capacity of assistant sales manager and later sales and traffic manager, has been appointed as district manager with headquarters in Minneapolis.

This is not a new territory to Mr. McCullagh, he having covered this field which extends from Montana east, including Canada, annually ever since his connection with the Yakima concern. Mr. McCullagh brings to the Distributors a most intimate knowledge of not only apples but other Northwestern fruit, his duties in the past having demanded personal supervision of the picking, packing and assembling of mixed cars of soft fruits, which are sold largely in the territory that he will

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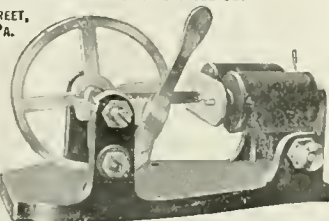
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Previous to his connection with the Yakima Valley Fruit Growers' Association, Mr. McCullagh was connected with the Chicago & Northwestern Railway Company for six years, traveling west from Chicago, and for seven years he was manager of large produce interests in Seattle. His past experience enables him to render the best of service not only to the Distributors, but to the trade in the territory which he will cover, being thoroughly conversant with the shipping, sales and traffic needs of the Northwestern territory.

Mr. J. S. Robinson has been appointed district manager of the Middle and Southwestern territory, with headquarters at Omaha. He has been with the Distributors since their organization, and last year had headquarters at Fort

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Canning and Home Canning.—A good many fruit growers in the Northwest have experimented in a small way with home canning outfits and found that the business can be conducted so as to save a great deal of fruit that otherwise might go to waste during the season when the markets are glutted. There is always a good demand for home canned fruits and particularly peaches and pears, which are consumed in immense quantities. It seems well worth while to suggest to fruit growers that they give the matter of home canning the proper consideration, and it certainly seems to the editor of Better Fruit that this work is well worth every fruit grower trying out, particularly where he has a family to look after this work without extra expense. The steam pressure outfits made by many of the canning machinery manufacturers certainly simplifies the process, enabling a canner to do the work much more rapidly at much less expense and turn out a product that is certainly far more reliable.

"The Development of the Fruit Package," the leading article in the July edition of "Better Fruit," written by E. D. Lake and W. B. Arens, was prepared as a special essay in a course of study at the Oregon Agricultural College known as "Commercial Pomology," in the Division of Horticulture in charge of Professor C. I. Lewis. Professor Lewis has made a study of the development of practical ideas in his classes by suggesting topics similar to this one and other subjects like picking, packing, transportation, storing and selling fruit, all of which comes in the course of "Commercial Pomology." About thirty of the young men register

in this course annually. Half of the year is given to the subject of problems in connection with the distribution of fruit crops. The editor desires to state in addition that the article on the "Status of the American Fruit Trade" in our July, 1914, edition, by R. M. Rutledge, a student at the Oregon Agricultural College, was written in a similar way at the suggestion and under the direction of Professor C. I. Lewis.

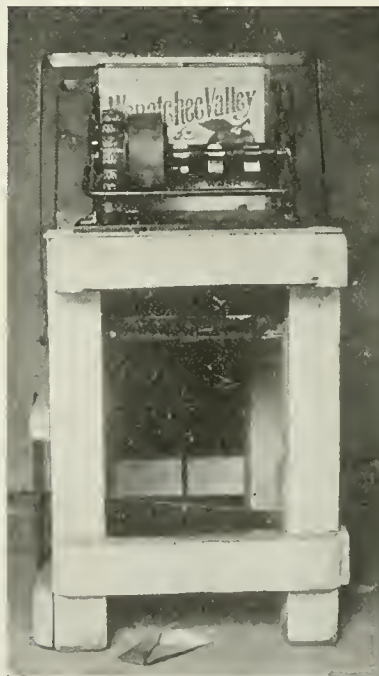
Fruit Graders.—The fruit growers of the Northwest have learned during the two hard years of 1912 and 1914 that two things are necessary in the fruit business in the production of fruit, namely, Efficiency and Economy. There are many modern conveniences that are being introduced which supply efficiency, enabling the grower to do his work much more economically. Perhaps no article which has been put on the market recently has rendered more service than fruit-grading machines, which are saving fruit growers all the way from 5 cents to 10 cents per box in packing, grading and sizing. Therefore, it seems advisable to suggest that every fruit grower should look into this matter for himself and see if he cannot do his work cheaper and save some money by using a grading machine.

Walnuts.—The walnut industry has been a paying proposition with nut growers who have good groves in bearing. Therefore, Better Fruit is pleased

to publish an interesting account pertaining to the walnut orchard of John H. Wheeler, Saint Helena, California, showing his success. Mr. Wheeler attended the University of California at the same time the editor was a student at that institution. Mr. Wheeler has made a specialty of walnut growing, and told the editor at the convention of California fruit growers at Davis, California, last year, that he had an especially fine strain of Franquette walnuts. The article in this edition will prove interesting and valuable to the fruit growers of the Northwest who are thinking about planting walnuts. Walnut growers' associations have achieved the greatest success of any of the selling organizations, having been able to secure extremely satisfactory prices every year for their walnuts.

Prunes and Plums.—The prune and plum industry is one which has made good money for the growers in the Northwest except in occasional years. Plums are grown extensively in California and shipped East in immense quantities by carloads. The Northwest has done very little in the plum industry, but has grown prunes quite extensively. With the profit made in these two varieties of fruits in the past in the Northwest, and in other sections as well, it would seem that the fruit grower would be justified in investigating the plum and prune industry, and therefore Professor Lewis has contributed a very interesting article which

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contains much valuable information on plums and prunes, which will be of interest to the grower in assisting him to make up his mind about the advisability of planting plums and prunes. This article also gives much valuable information about varieties which are best adapted to the Northwest, and the ones which are the best money makers.

Apple Harvest.—The apple picking and packing season will begin in September with the fall varieties. It is no unusual thing for dealers to be short on supplies, such as picking buckets, baskets, ladders, etc., during these years of depression, when dealers are ordering in small quantities. Therefore, it seems wise to suggest to the fruit grower that it is advisable for him to order his ladders, picking receptacles, nail stripper, box press and stamping machine, and such other articles as he may need, without delay, for otherwise the supply in the different local stores may be sold out and consequently the grower will be unable to get just what he wants, when he needs it the most. Therefore, the editor seems justified in advising the fruit growers to give attention to this matter promptly.

New Fruit Juices.—Since the wave of prohibition has swept over the country people are now looking for new drinks. Prohibition will undoubtedly create an immense demand for many kinds of fruit juices, which will enable the fruit grower to convert much of the surplus into juices, in this way realizing a good profit and saving much waste. The short article on New Fruit Juices in this edition is forth reading.

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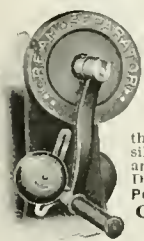
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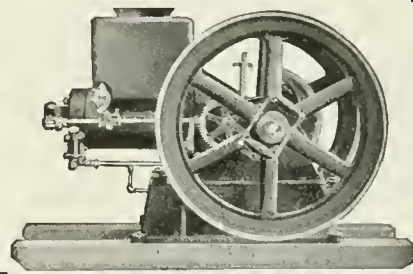
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Comfort for the Milch Cow

Careful dairymen are paying greater attention each year to the little savings hitherto unthought of in the way of stock. Particularly is this true in protecting the herd from the annoyances which have hitherto been regarded as altogether in the course of nature. Barking dogs are being less and less permitted upon the premises, still less to chase in the cows. The necessity of pure drinking water is appreciated as never before, and above and beyond all else, the loss in milk production, flesh, time and temper, incident to the irritation of winged pests—flies, gnats and mosquitoes, is being combatted as never in the past. There are on the market today reliable preparations which act as absolute fly repellants, used externally, harmless yet wonderfully effective. Applied with a sprayer or with a soft cloth, sponge or brush, to the exposed surface of the cattle daily, they furnish instant and complete relief. No dairyman can afford during the fly season to be without a supply. Their use will spell dividends many, many times in excess of the slight initial cost. The government is now issuing bulletins advocating the use of fly repellants.

Asphalt-Base Oils Are Best Lubricants

Lieutenant G. S. Bryan, of the Naval Engineering Experiment Station, Annapolis, Maryland, in a paper published in the Journal of the American Society of Naval Engineers for February, 1915, says: "Oils made from asphalt-base crudes have shown themselves to be much better adapted to motor cylinders, as far as their carbon-forming proclivities are concerned, than are the paraffine-base Pennsylvania oils. The carbon formed from the latter is, as a rule, extremely hard and clings to the metal surfaces, while that from the former is soft and can easily be wiped off any surface that it is deposited on. This would be expected from a consideration of the nature of the hydrocarbons composing the oil, and it has also been demonstrated in practice. The explanation lies in the fact that the paraffine-base oils are generally composed of the paraffine series of hydrocarbons, while the asphalt-base oils are composed mainly of the ethylene and naphthene series. One of the characteristics of the latter two series, as compared with the paraffine series, is their tendency to distill without decomposition.

The New Three-Grade Cutler FRUIT WEIGHING MACHINE

Delivers an EXACT PACKING SIZE to each bin and makes the packing of fruit in boxes a simple affair at one-half the cost of hand methods.

Our new models employ a simple method of weighing the fruit—the only principle by which the necessary accuracy can be accomplished. We know this sizer to be more efficient than any other machine on the market.

The Outstanding Features Are:

ASTOUNDING accuracy and the ability to regulate the delivery to any bin so that every layer packed at random therefrom will have the desired tightness and every pack will have the same height. Use your ordinary help as packers.

A quiet, gentle handling of the fruit—**no bruising** or violent dropping or roll of the fruit.

Automatic feed with a belted sorting table accommodating from four to ten sorters.

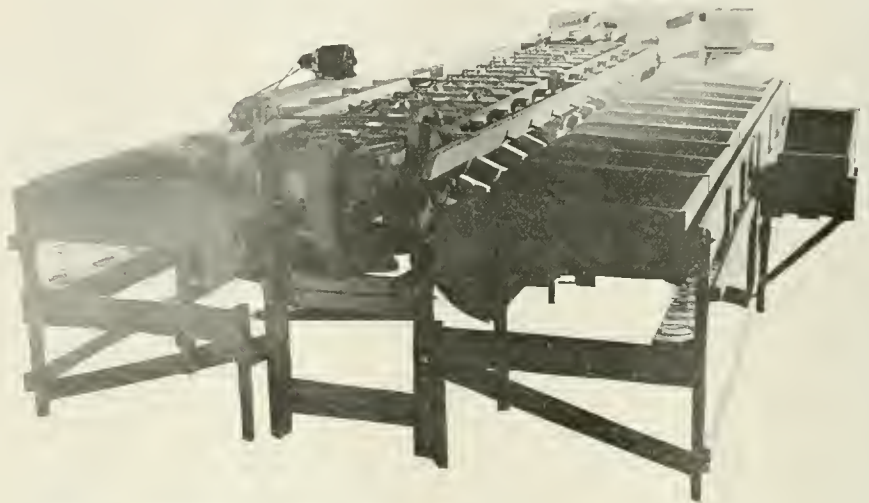
WORKING CAPACITY up to 1,000 boxes in ten hours.

Built sectionally in three sizes so the capacity can be increased later by the addition of a section.

Patented spring supported bins with three times the capacity of ordinary bins and a practical device to move the fruit into the bins without any pawing or raking of the fruit by the packer. These bins are far in advance of those used on any other sizer.

The **CUTLER SIZER** can be quickly set to handle either two or three grades and each grade has a separate set of bins.

This machine has the benefit of our three years' experience in the manufacture of sizing machines.



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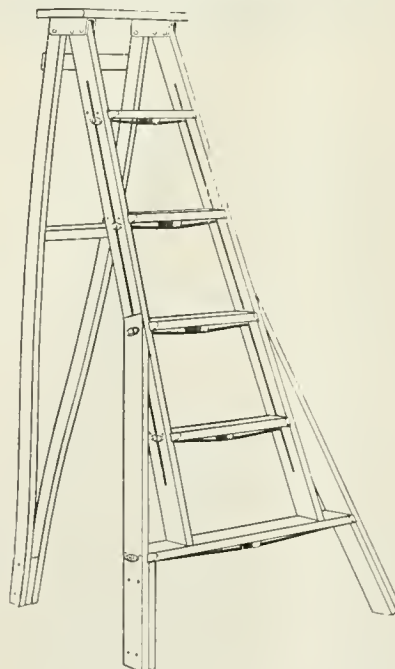
Barnett Picking Pail



Made of heavy galvanized iron. Has a canvas sack lining with patented opening and closing device. If you like a picking pail you will want a Barnett.
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dozen lots 16.50

These are but three of the articles shown in our new catalog of orchard and packing house supplies. Write for this catalog. We have the goods you need at the right prices.

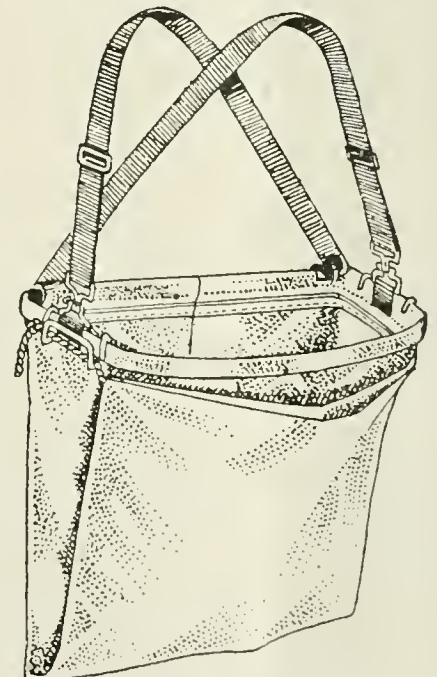
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Only well seasoned spruce used in its construction, with each step braced. Strong and rigid, it weighs but 3 lbs. to the foot. A thoroughly high grade orchard ladder made in six to fourteen foot lengths.

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Portland Picking Bag



A strong canvas sack with broad shoulder straps. Does not tire the picker and enables him to use both hands in picking. Easily and quickly emptied. A speedy and economical device for every orchard.
Price, single bag \$1.50
dozen lots 15.00

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BAILEY'S Standard Cyclopedia of Horticulture should be close at hand for quick reference by every member of your force, because it presents the combined labor and experience of the foremost North American authorities on horticultural subjects. These six magnificent volumes place at the disposal of the horticulturist, whether practical, amateur or scientific, an ample and readily accessible account of every subject which at any time may be of interest or practical use in his calling. Its range is wide, covering plants, flowers, vegetables, trees, tillage processes, tools and implements, cultural discussions, botanical history, geography, commercial markets, and a myriad items that only constant use will reveal. The scope of the volumes has not been confined to botanical subjects alone, but every subject in any way incident to the activities of the horticulturist has been fully covered, commercially as well as scientifically.

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Three volumes now published. Write us for 16-page Prospectus containing Complete Description and Our Special Offer.

BETTER FRUIT PUBLISHING CO., Hood River, Ore.

Soil Management and Irrigation

By L. G. Dunn, Manager Swiss Valley Ranch, Incorporated, Bliss, Idaho

THE subject of soil management and irrigation is an important one to the fruit grower and the farmer of the Northwest. Without any question the soil of Southern Idaho has most wonderful productive qualities when properly managed. Therefore, we will not enter into the discussion of the different kinds of soils in technical terms, but accept our Idaho soil as it really is, making the leading thought of the

subject: First, soil management to so regulate the soil elements of soil fertility as to make them available for plant life; second, irrigation, to regulate the soil moisture, which is most essential to help create the chemical actions that take place between the different elements of fertility, making plant-food available to the grasp of the hungry plants. Without moisture in the soil all other elements of plant food are worthless.

Idaho has some of the richest soil in the world, as has been proven by the many record-breaking crops that have been produced in the Twin Falls country, as well as in other parts of the state. It is simply a question of how are we going to get the maximum yield from the land? This question is constantly before the American farmer. If Neighbor Jones gets 100 bushels of oats per acre, and Neighbor Brown but 40 bushels on practically the same soil, on adjoining farms, there is a reason. If one end of a potato field yields twice as many good marketable potatoes as the other end, there is a reason for it. And the reason is generally found in the previous management of the lands in question. If we go into these fields and study in detail methods of soil management of Jones and Brown for a few years back, we will no doubt learn why both fields did not yield 100 bushels of oats per acre, as they should.

Several years ago I cut some oats for a neighbor with my twine binder. In going around a ten-acre field I found one end of the field very short, about 30 bushels to the acre. On the other end about three acres was so rank that I could hardly get through. This end would make about 90 bushels to the acre. I asked the reason, and it was explained in this way. Where the short grain was it had been in oats ever since it was cleared—five years. The other end was an old alfalfa field, followed two years with potatoes, then the oats. There was a reason. This lesson I have never forgotten. Since that time I have studied many such conditions in an effort to solve some of the many problems of soil management and irrigation.

The major portion of the soil is decomposed rock and had its origin in the rock masses of the earth surface, which has been transformed into its present form by the action of the weather, changes of temperature, erosion by rivers and glaciers. As the bulk of the

Patent for Sale

Patent Fruit Gatherer—saves the work of several men. Inexpensive, easily operated. Moderate investment. Write for particulars.

ASSOCIATED INVESTMENT CO.
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What are your dairy problems?

To get started profitably in dairying as a side-line, the fruit grower needs helpful advice and suggestions.

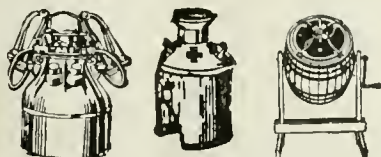
Our service department will delight in doing this very thing, without any charge or obligation.

We are sole Oregon distributors for "Simplex" Separators, B-L-K Milkers, Papee Ensilage Cutters, Simplex Silos and all kinds of dairy, butter-making and cheese-making supplies.

Your name on a postal will bring Free Catalogs

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St. Louis	71.20	88.10
Chicago	72.50	90.00
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Omaha	60.00	77.50
St. Paul	60.00	84.25
Milwaukee ...	72.50	90.00
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Many other places in proportion.
Send for booklet.

10-day stopover on one-way tickets East through California via this route.

"THE NORTH BANK ROAD" between Spokane, Portland and the Pacific Ocean traverses one of the choice scenic regions of the world.

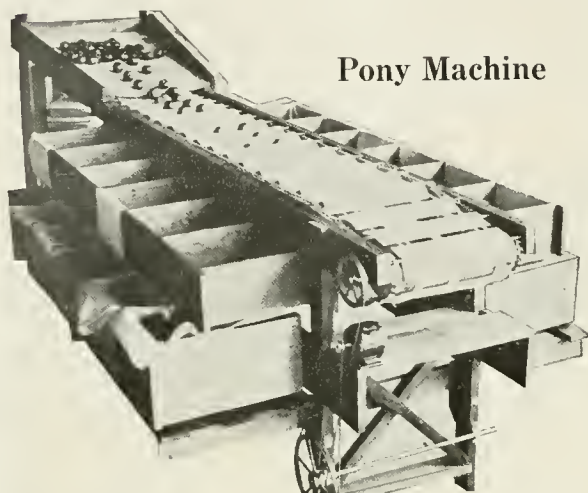
R. H. CROZIER, A. G. P. A.
Portland, Oregon

Palmer Fruit Sizer

Standard Machine, \$200, Floor space 6x24 feet.

Sizes three grades at a time. Capacity two earloads daily.

{ First grade into nine sizes.
 { Second grade into four to six sizes.
 { Third grade into three to five sizes.



Pony Machine

Pony Machine, \$150

Floor space 6x12 feet.

Sizes two grades at a time into four or six sizes as desired.
 Capacity one earload per day.

Either machine can be used for boxes or barrels. Openings on both machines expand uniformly from 1½ inches to 4 inches square.

Illustration shows sorting table attachment; also travelling belts for sorting table.

Machine discharges the fruit into boxes or barrels without bruising.

Box packing can be done direct from the machine or, if preferred, on separate tables, giving the grower a chance to work his packers on the particular sizes and grades he wishes packed first.

Write or wire for catalogue and prices.

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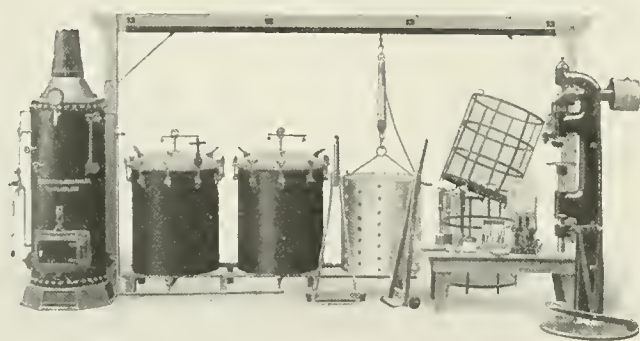
soil is decomposed rock it carries mineral fertility. The additional material being organic matter, composed of decayed animal and vegetable matter. This organic matter, called humus, carries the nitrogenous plant food, and is one of the most important factors to be

considered in the study of the soils of this country.

The soils of Southern Idaho are rich in all of the most important mineral elements of plant food (which as a rule are well equalized) but are deficient in organic matter and nitrogen so essential

to plant life. Our soil is well supplied, as a rule, with all the various mineral elements of soil fertility except, nitrogen, which we must supply. The question then, is how to supply this nitrogen in available form. Plants cannot use this nitrogen in its free form. But certain microscopical forms of life that grow upon the roots of leguminous plants, forming nodules thereon, have the power, through the aid of the oxygen of the air, to take this free nitrogen from the air and convert it into organic nitrogen, available for plant food.

The most important of the legumes is alfalfa. Alfalfa being a very deep-rooted legume is able, through its nodule-forming bacteria within its roots, to place nitrates deep in the soil, and greatly increase the fertility of the soil to that extent. Though it may draw heavily on the other elements of the soil they are generally so abundant in the soils of the Northwest it only tends to equalize the amount of the available supply of the different plant foods within the soil. And for this reason all crops do so well following alfalfa. Organic matter may also be supplied to the soil by plowing under any vegetation, green cover crop, or by the application of barnyard manure. As a great many of the fruit growers and farmers of this country do not handle much live stock, a liberal supply of barnyard manure is not available. Therefore the organic matter must be supplied to the soil by a systematic rotation of crops, cultivation and irrigation.



Canning!

Canning!

This Steam Pressure Canning Plant will save your perishable Fruit Crop when nothing else will. Ten different size outfits to select from.

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HENNINGER & AYES MFG. CO.

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FOR SALE

One H. & A. Steam Fruit Evaporator of one ton capacity of green fruit in 24 hours. The machine contains 45 trays of 24x38 inches. This machine has been used as a demonstrator for about six months and is in good condition. Price, f.o.b. Portland, Oregon, \$250.00 complete with pressure reducing valve and steam trap. 5-horse power boiler required to run it.

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IN LIEU OF POTASH

Under the present shortage of potash, we recommend super phosphate used in conjunction with lime.

Apply 200 pounds of super phosphate with a half ton of lime per acre for assured success

In super phosphate you supply the fibre builder, without which seeds will not form and mature.

Moderate in price. Easily sown without special soil preparation.

Apply immediately or during the next ninety days.

Write for prices.

PORTLAND SEED CO.

PORTLAND, OREGON



The availability of soil fertility is dependent upon natural conditions and soil management. Supposing that we have all the necessary elements of plant foods in the soil. The soil must then be in the right compact condition, with moisture, warmth and soil air, in order that various chemical changes may take place for the development of plant food, available to the grasp of the plants, to produce plant life. No matter how rich the land is in plant food, unless the three leading factors, moisture, warmth and soil air, are present, the various chemical changes incident to the decomposition and development of plant food, cannot take place. Without air in the soil the seeds will not germinate and grow.

If air is excluded from the soil where plants are growing, they will get yellow and sickly and will die, if the air is excluded long enough. Soil must be ventilated, first, by tillage. All the different processes of cultivation produce a change of air in the soil to a certain extent. Second, by vegetation. The growth of any kind of vegetation, by drawing moisture out of the soil tends to draw air in to take its place. A greater aeration of the deeper soil is possible by the decomposition of the roots of the deep feeding plants that leave openings as the roots decay that admit soil air and nitrogen. Third, by the addition of humus. Barnyard manure, weeds, stubble, or any vegetable matter plowed under, will tend to aerate the soil. Air is necessary in the soil to supply the oxygen for the development of the nitrogenous plant food, and also needed for the processes of decomposition and other chemical actions that develop the various forms of plant foods.

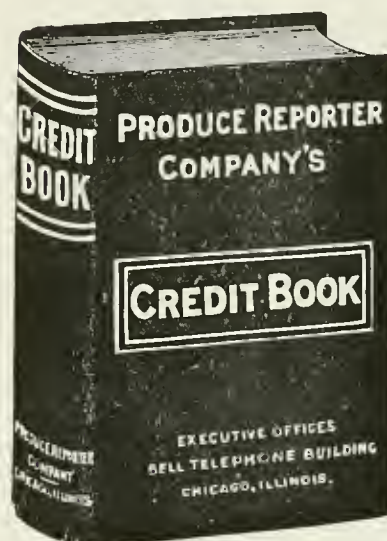
A proper degree of temperature is an indispensable factor for a high degree of fertility. It is said that corn requires a soil temperature of 60 or 65 degrees during some part of the day for satisfactory germination. And if the soil is so cold as to allow only slow and feeble germination, the crop can never make the growth and development that it would have made under the same after-conditions but with a good, vigorous start. Speaking of plants, we have reference to fruit trees the same as any other plants. A dark-colored soil will absorb more heat from the sun than will a light-colored soil. A south slope will hold a higher temperature than a level field. A smooth and compact soil with a soil mulch on top, made so by thorough tillage, increases the temperature of the seed bed by removing any excess of moisture that may exist and by checking the evaporation from the surface. Tillage also favors the more rapid decomposition of the organic matter in the soil, which action produces heat. Rapid evaporation processes have a marked cooling effect upon the soil, the same as the evaporation of moisture through the canvas of a water bag tends to cool the water in the bag. This illustration proves that rapid evaporation of moisture from the soil will lower the temperature. This is especially true where land has been flooded

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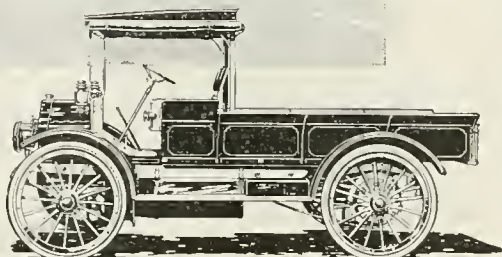
The **Credit Book** guides you to reliable, responsible buyers — points out the "tricky" and "unfair" dealers — gives the summarized experiences of other shippers with every firm in every market. It is used today by the great majority of successful fruit and produce handlers.

Our Inspecting and Adjusting Department looks after rejected or complained of shipments — Adjusters located in all principal markets. Collections, Litigations, Railroad Claims promptly, efficiently handled for members.

Produce Reporter Service operates on the correct co-operative principle for the mutual benefit and protection of members — It enables the smallest shipper to profitably compete with the largest "Distributor." It affords the only practical solution of your problem — write us today for full information — you incur no obligation whatever in doing so.

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International Motor Trucks

TIME is such an important factor in the marketing of fruit and vegetables, that any reasonable device for saving time receives earnest consideration. Perhaps the principal reason why **International Motor Trucks** are so popular among fruit and vegetable growers is because they save so much time on the road.

Around the larger cities truck farmers buy **International Motor Trucks** because their produce is on the road from one to three hours less time and is, therefore, delivered in such good condition that it commands the best prices.

Add to this advantage the ability to see customers first, which an **International Motor Truck** gives, and add again the saving of time on the return trip, and you have three good business-getting, money-making reasons for buying an **International Motor Truck**.

There are also other good reasons which every fruit and vegetable grower should know and which it costs nothing to find out. Drop us a line and we'll send you complete information about our three motor truck models, "M" for 1,000-lb. loads, "E" for 1,500-lb. loads, and "F," the new **International 2,000-lb. truck**.

International Harvester Company of America

(INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
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There Are Big Profits in the Cider Business

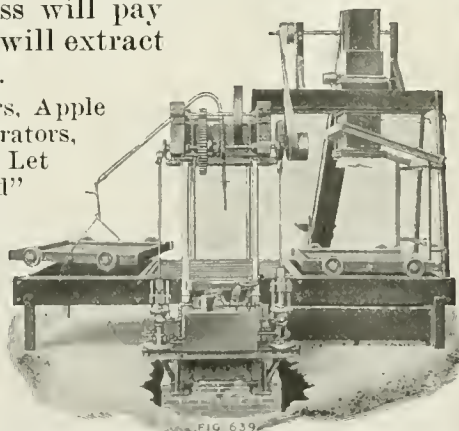
Let us tell you how you can earn big profits making Cider, Vinegar, Apple Butter, etc., on a "Mount Gilead" Hydraulic Cider and Grape Juice Press. A "Mount Gilead" Cider and Grape Juice Press will pay for itself in the extra juice it will extract as compared to other makes.

We manufacture Evaporators, Apple Butter Cookers, Vinegar Generators, Cider and Vinegar Filters, etc. Let us tell you about "Mount Gilead" outfits and how you can put good profits in your pocket by their use.

The Hydraulic Press Mfg. Co.

60 Lincoln Ave., Mt. Gilead, O.

Pacific Coast Representatives
THE BERGER & CARTER CO.
17th and Mississippi Streets
San Francisco, Cal.



and has an excess of moisture under a puddled surface. In this case a thorough cultivation as soon as the land is in condition to cultivate, making a soil mulch to conserve the moisture in the lower soil, will raise the temperature.

The matter of supplying artificial moisture to the soil by means of irrigation, is no doubt the most important feature of soil management. And irrigation justly comes under the head of soil management in any irrigated country. The amount of moisture in the soil and the way it is applied or drained off, tends to regulate the movement of soil air, and affects the temperature, the decomposition of organic matter, and transforming the various mineral elements into soluble forms of plant foods available to plant life. The corrugation or furrow system is the best method of irrigation. Our plans in irrigating the Swiss Valley orchards, where we have 120 acres of young apple trees and 230 acres of Italian prunes, one and two years old, has been to start to irrigate the young trees as soon after planting as possible, within a week, anyway. We make furrows on each side of the tree rows, about 18 inches from the trees, and allow the water to soak well into the roots. When the land is not very moist we follow the planters as soon as possible and run the water directly into the hole and puddle each tree. We found the very best way to plant a young tree was to puddle it in as it was being set, either by irrigation or by pouring in a bucket of water on the roots and then cover that up with about four inches of dry soil. By this method we got nearly 100 per cent stand.

The greater portion of our land is rather coarse sandy land, and the water percolates rapidly and subs well. The second year we run the furrows farther away from the trees on both sides, allowing the moisture to reach the roots by subbing as much as possible, thereby retaining the soil air with the moisture, generally following each irrigation by a thorough cultivation, which aids greatly in the development of nitrogen.

When we raise other crops between the trees we never plant anything nearer than four feet from the trees, and the trees are irrigated and cultivated the same as if there was no other crop there. We raise alfalfa, clover, corn, beans and potatoes between the tree rows, and find the trees do as well there as where we clean cultivate. In fact, where we have potatoes or beans between the trees they have done better than any place else. Where other crops are raised between the trees it takes more water. However, where the trees are cultivated and irrigated as usual and the crops between the rows are kept in good condition by thorough cultivation and irrigation, the trees will make as good healthy growth as if no other crop was there. Where trees are making a good healthy growth it is not best to irrigate too late in the growing season, as it is best to let the new wood harden up a little before the extreme cold weather sets in. In this re-

gard, one must be governed by local conditions. If the land is clean cultivated the water may be turned off in August. But if weeds, grass or crops are growing near the trees they will require water much later. In extreme cases, where the land is foul and the soil has a good under-drainage, it is best to irrigate until October or until there is some fall rain. In case of a very dry fall, such as the one just past, I think it a wise plan to irrigate the orchard some time in November, after the leaves have fallen.

As an experiment we irrigated a portion of our young apple orchard last November. The results of this experiment will be carefully noted next summer, as a future guide. I am quite sure the results will be very favorable. The extreme dry weather last fall, and the extreme cold spell that we had in December is an unfavorable condition for young trees, and we may reasonably expect some damage by winter-killing, though it is impossible to tell at this time what the outcome will be. The most essential feature of irrigating an orchard for best results is to keep an even degree of moisture in the soil, by close attention to the irrigating and cultivating at the right time and in the right way to meet local conditions. I am quite sure that a well regulated and even degree of moisture under a bearing orchard will have a very favorable effect upon the keeping qualities of the fruit in storage or transit. If the trees are allowed to get very dry while the fruit is maturing, then the moisture applied, the fruit will take a new start and make an unnatural growth that is unfavorable to the keeping qualities of that fruit. I am not very familiar with this feature, but it seems to me that it is a very important one, and the matter should be thoroughly discussed by the State Horticultural Association.

In conclusion, there are a few leading thoughts to keep in mind. Preparation of the soil, by deep plowing and a system of cultivation that will place the soil in the right degree of compact. Supply the much needed nitrogen, by the application of organic matter, by a system of crop rotation, cultivation, and the application of manure. Regulate the soil moisture by careful irrigation and cultivation. Cultivation plays the most important part in regulating the three leading factors, temperature, moisture and soil air.

Mr. J. N. Shotwell, a fruit grower of Wenatchee, last year patented a practical device which is giving splendid satisfaction for stencilling boxes. It stamps the grower's name, postoffice address, the number of apples contained in the box, grade and variety, all on one end of the box in regular alignment at the one movement. Such facilities which save labor and expense are going to be big factors in helping the fruit grower solve his problems by reducing the cost of production. This machine is being manufactured and put on the market by Shotwell & Wilmeroth, Wenatchee, Washington.

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It is by no means confined to this method, but thoroughly covers every detail of road construction and maintenance, and the uses of all modern methods and appliances for this purpose. It is fully illustrated by halftones and original plan and sectional drawings. A copy will be sent free to any supervisor, path master or private party who has anything to do with building or maintaining roads.

Write to us at once and you will get one the first copies issued. Ask for booklet No. 338.

Good Roads Department

Du Pont Powder Company, Wilmington, Del.

GOLDEN GATE WEED CUTTER AND MULCHER

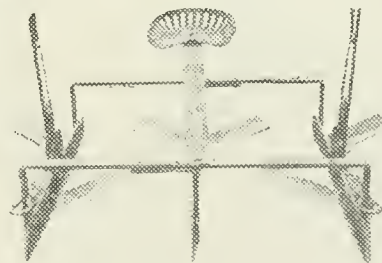
Not only cuts down weeds, but KILLS them—and leaves finely pulverized top soil. Cuts any depth. Prevents evaporation by working under soil without disturbing soil on top.

See them at the Exposition, Block I, Agricultural Palace

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You can buy an
Edgemont Lid Press from

To Growers and Shippers of High Grade Apples in Boxes
We Recommend Our

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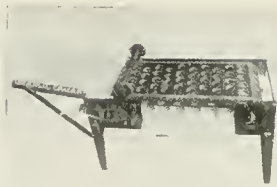
Strong, Durable, Convenient and Moderate in Price

That a Lid Press with nail stripper and cleat box, brackets to hold lids where you want them, cleat hooks to hold cleats while nailing and a perfect treadle ratchet is appreciated by the growers is shown by the sale of hundreds of them to growers not only of the Northwest but of nearly every fruit district of the United States.

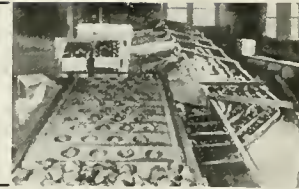
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Universal Fruit Sizer and Conveyors
 Most Efficient. Least Expensive. August is the month to investigate Universal Graders
WESTERN FRUIT GRADER & MFG. CO.
 Grand Junction, Colorado



The Use of Dynamite in the Orchard and Garden

By Floyd Wertz, Oral, Fall River County, South Dakota

DOUBTLESS the most of us have always thought of dynamite as a powerful agent of destruction to be used only in warfare, tearing to pieces great rocks in road-building and mining, and criminally used in wrecking buildings, etc. I am proud to live in an age where the use of high explosives in the peaceful and remunerative occupation of farming is becoming nation wide. The stability of our nation depends not so much upon our being a nation of warriors, but more upon our resourcefulness as agriculturists and stockmen.

There are many times on the farm when a powerful rending force is necessary in such work as breaking rocks, tearing out stumps, ditching, etc., and deep subsoiling for trees and the field crops. In this article I will explain the uses of dynamite in that indispensable part of the farm, the orchard and garden. In the orchard or garden it is impracticable to use heavy deep tilling machinery, and dynamite does the work thoroughly and econom-

ically. In impervious soils there is a deficiency of moisture, humus and air. Deep tilling allows water that would otherwise stand on top until evaporated to be absorbed and stored in the subsoil for use in possible dry periods. It enables the farmer to supply humus to a greater depth in the day of deep-rooting legumes and manure. It allows the circulation of air to a proper depth.

Land once deep tilled with dynamite will not need it again in years, if it is properly surface tilled and fertilized. My experience is that from 40 to 50 pounds of 20 or 25 per cent dynamite, divided into one-fourth pound shots, will do a thorough job on an acre of ground. In preparing horseradish and asparagus beds and planting trees and shrubs, we have found it to be of great value. After having failed to grow good horseradish for three years, we prepared a bed by exploding one-sixth pound charges at a dept of two and one-half feet, spaced about eight feet apart. Since then we have secured root of large size and good quality. In preparing ground for a row of asparagus, we exploded one-sixth pound charges, spaced four feet apart and about two and one-half feet deep. This made it easy to dig a narrow ditch two feet deep, which we filled to a proper depth for the roots with rotted manure well mixed with earth. This asparagus did not suffer in the driest weather. Although impervious soil may be rich in mineral plant food, we must bear in mind that it is deficient in humus, and to have lasting benefits from deep tilling this humus must be supplied. In the case of an orchard, where deep-rooting plants cannot be planted, this humus should be supplied in part at the time of setting the trees.

The method of blasting for and setting trees is about as follows, depending somewhat upon the character of the soil, depth of hardpan, etc.: The holes are easily made by driving a pointed steel bar, one and one-half inches in diameter and four feet long, to a depth of from two and one-half to four feet, as the depth of the hardpan calls for. The bar should not be driven entirely through the hardpan, but within from six to twelve inches. A one-half pound stick of 20 or 25 per cent dynamite is primed with cap and fuse and carefully lowered and tamped. The first six inches of earth should be tamped very lightly and the balance should be tamped as tightly as can be done with a wooden tamping stick. The charge is now ready to explode, which is done by lighting the fuse. After the explosion a barrel-shaped

chamber is usually found, twelve or eighteen inches below the surface. This should be filled to a proper depth for the tree with rich humus-bearing earth and the hole is ready. Set the tree and fill the balance of the hole with rich earth, and it has every chance to live, as far as its root-bed is concerned. Now, in the center of the squares formed by each group of four trees, it is an admirable plan to blast a hole and fill with well-rotted manure, leaf-mold, etc. This place takes water readily and plant food is soon absorbed on all sides which will help feed the trees for years.

Orchards set in spade-dug holes may be cultivated by exploding dynamite between the rows, or if the trees are far apart, three small charges around

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each tree about six feet from it. Where the dynamite is exploded close to the tree it is necessary to break through to the chamber and fill it with moist rich topsoil. Deep tilling with dynamite should be done when the soil is reasonably dry. In the case of some of our western country the hardpan absorbs but little water even though the topsoil is at times excessively wet. If the dynamite is placed at the proper depth, this may be subsoiled at any time. The best time for subsoiling and blasting tree holes is in the fall. This catches the winter and early spring moisture and stores it for use later on. A few trees well set and cared for will beautify the landscape far more than a large number poorly set and cared for. I have known of hundreds of trees dying in the last few years, not for lack of rainfall, but for lack of conserving the rain that did fall. By all means use explosives for making tree holes, even though by so doing fewer trees may be set.

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 Southwest Washington Fair, Centralia-Chehalis, Washington, August 23 to 26.
 Columbia River Interstate Fair, Vancouver, Washington, September 6 to 11.
 Walla Walla County Fair, Walla Walla, Washington, September 13 to 18.
 Spokane Interstate Fair, Spokane, Washington, September 13 to 18.
 Washington State Fair, North Yakima, Washington, September 20 to 25.
 Oregon State Fair, Salem, Oregon, September 27 to October 2.
 Cascade International Livestock Show, North Yakima, Washington, November 22 to 27.
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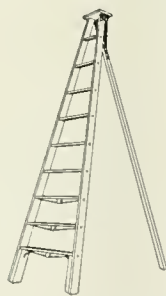
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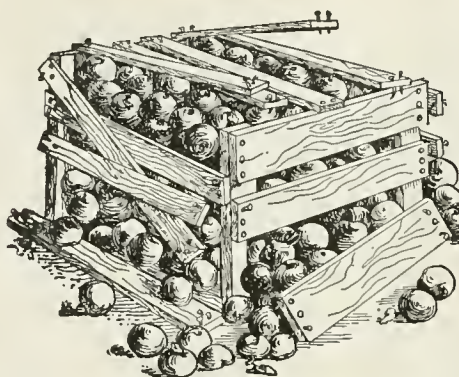
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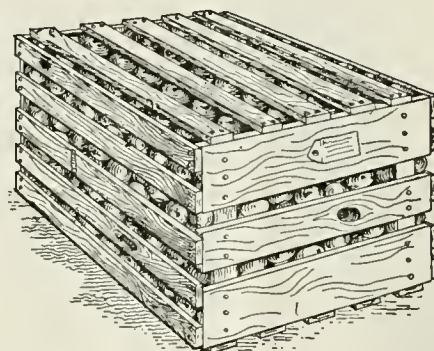
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Moving the Fruit Grower Into Town

By Geo. F. Whitsett, of the International Harvester Company of America

WITH the fruit grower the moments are golden. He must gather his crop on a certain day—the day it gets ripe. He must keep it cool. He must get it to market the same day or the following morning. All of these things require speed, precision and expedition. The fruit grower and corn raiser must then be as different as their jobs. The former must be able to think and act quickly. These conditions and the kind of men that meet them, may have something to do with the fact that motor trucks are coming so rapidly into use in the fruit

growing business. The head of the motor truck department of a large concern recently said: "Judging from the development during the past year, I believe the motor truck will supplant soon practically all other forms of delivery in the fruit growing business."

When we look into the advantages of motor truck delivery over horses and wagons for growers of fruit, we wonder only why the change has not been more prompt than it has. Markets are often a long drive from orchards. One grower in an Eastern state had to rise at one o'clock every morning to get to market, 38 miles distant, and to arrive at 7 a. m. This was hard on the disposition, but it was necessary so long as horses were the motors. One day a motor truck salesman came along, showed the grower some interesting figures, and he now gets up at 4 a. m., just as the birds are starting on their morning's music and the colors in the east are becoming attractive.

Another fruit grower, who lived a long way from town, often found the market glutted when he reached it. Growers who lived nearer had unloaded before he could possibly arrive. There were other markets, but it was out of the question to make them with slow delivery. The hot sun would mount high into the sky before another city could be visited. There was nothing to do but return home. A motor truck moved this raiser nearer town. It enabled him to enjoy an even chance with growers who lived nearer, and in case he found the demand in that market satisfied, he had no cause for worry. He could go on to a second market, or even a third. The motor truck lengthened his reach, his stride. It moved him in, and solved his specific problem.

Growers of all tender-skinned fruits that are susceptible to rapid decay have a further thing to keep them awake nights. That is, how to pick their fruit in the cool of the day and get it delivered. The man who has a refrigerating establishment can outwit nature, but the small grower must meet her conditions. Peaches, on account of

their delicate complexions, are always a worry in this way, and the same, to some extent, is true of other sensitive fruits.

One peach grower lived so far from a town in New Jersey that he could not gather his fruit after four in the afternoon and get it into town. Picking in the heat of the day meant hot, damaged fruit, and late picking meant no market. A motor truck solved the dilemma and made the producer master of the situation. It gave him leisure,

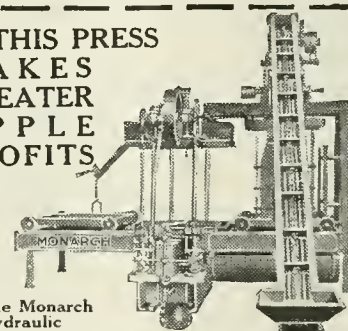
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independence and a new hold on his proposition.

The Wyman Fruit Farm, Brunswick, Ohio, was up against the distance problem and solved it to its own satisfaction with a motor truck. "I feel sure we would not be able," says J. P. Wyman, manager, in commenting on the situation, "to handle our fruit crop without the use of the motor truck. Living, as we do, eighteen miles from market, the truck saves us many dollars in time and expense, over horses, in handling our fruit."

Thus, in matters of time, convenience, wider range of markets, grasp of the job, and peace of mind, the motor truck is proving to be the most popular hit on the fruit grower's program. It means shorter hauls, quicker deliveries, more profit, and a better time for the fruit grower; fresher fruit, better fruit and more fruit for the consuming public.

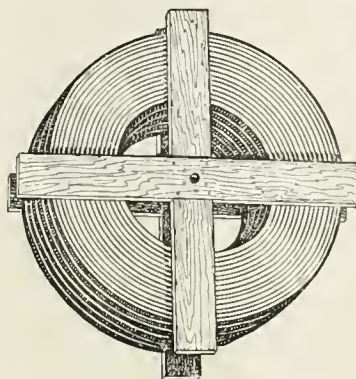
New Fruit Juices for the Home

That the juice of currants, blackberries, black raspberries, sour cherries, and peaches may be prepared and kept as successfully as grape juice and by the same methods, has now been demonstrated in the course of a series of investigations which the United States Department of Agriculture is conducting into the whole complicated question of fruit juices. The juices of the fruits mentioned, it has been found, retain their characteristic color and flavor after being sterilized and stored away, and can, therefore, be made available for use throughout the year in households and at soda fountains, etc. In this way it is thought much fruit that has hitherto been allowed to go to waste may be utilized.

For reasons, however, which are not as yet very thoroughly understood, the various fruits differ greatly in the effects of sterilization upon them. Thus, strawberry juice and red raspberry juice lose their distinctive colors and flavors very readily, and, therefore, cannot be put up on a commercial scale and marketed as grape juice is. Lemon and orange juices also undergo peculiar changes in flavor after sterilization, and no satisfactory method of overcoming this obstacle has yet been developed. Lemon juice is the more promising, but this, too, cannot yet be manufactured commercially with success. With certain precautions, on the other hand, pineapples can be made to yield a sterilized juice of a very attractive flavor, which should have distinct commercial possibilities. The juice, however, should be kept in cold storage at from 32 to 35 degrees Fahrenheit after sterilization, and most of the suspended material should be removed by means of a milk separator or by filtration. Moreover, where atmospheric oxygen is not excluded in the process of bottling, the juice darkens gradually.

These studies have already resulted in the discovery of a method of producing concentrated apple juice by freezing, which is not only easier to ship

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than ordinary cider, but which will
keep much better. In the concentrated
juice, however, the presence of sugar
and acid retards the growth of micro-
organisms and fermentation is very
slow.

Similar methods are now being tried
out with other fruits. In the case of
grape fruit-juice, for example, concen-
tration to a syrup by freezing is easily
accomplished, and it appears at the
present time that there are great com-
mercial possibilities in this method,
although further experimentation is
considered necessary. In the case of
fruits whose juices do not suffer any
change of flavor or color in the process
of sterilization, this method is not likely
to prove necessary.

Details of the experiments, with a
discussion of the effects upon the vari-
ous fruits of sterilization, exposure to
atmospheric oxygen after sterilization,
storage at low temperatures, etc., are
contained in a new bulletin of the
United States Department of Agricul-
ture, No. 241, "Studies on Fruit Juices."
—U. S. Department of Agriculture Bul-
letin.

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Bordeaux mixture is the standard fall
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to control Anthracnose; on peach trees
and other stone fruits to control Peach
Blight, Shot-hole Fungus, etc.; and to
control Anthracnose on grape vines,
raspberries, etc.

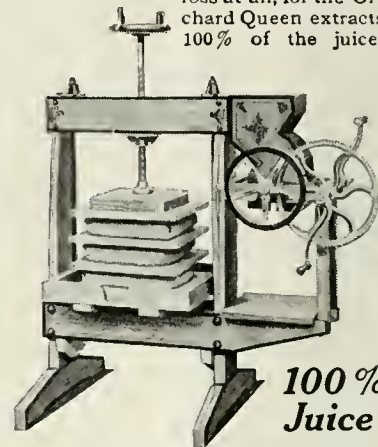
"ORCHARD BRAND" Bordeaux mix-
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It is, in reality, a more ECONOMI-
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WITH an Orchard Queen Cider
Mill you can make your
windfalls, culls and unmarketable fruit
pay you 50 cents a bushel. No waste or
loss at all, for the Or-
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100% of the juice.



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breaking the juice cells so that when pomace
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all the juice is extracted. Easily operated by
either hand or power. Strongly built in one
size only—sold at a low price.

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to convert your orchard losses into profits.

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Prevents fruit-laden trees from breaking, holding the limbs up more efficiently and at much less expense than propping. Holds limbs in place, preventing damage and dropping when the wind blows. Meshes are large enough so fruit can be picked through them—open at bottom so picker can get inside the net, or net can be removed at picking time.

This net of finer mesh will keep the birds from eating the blossoms or fruit in districts which are thus troubled.

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Apple as a Farm Product, Etc.

Continued from page 8

represent something like the commercial crop. Estimates for 1896-97 and 1898 are from "Better Fruit," Vol. V, No. 5, and estimates for 1911, 1912, 1913, 1914 are from various sources, including the Pomology Department at Cornell University and certain government figures. All of the years are from estimates of the American Agriculturist:

TABLE VIII.—UNITED STATES PRODUCTION
OF APPLES IN BARRELS

1896	69,070,000	1906	38,280,000
1897	41,530,000	1907	29,540,000
1898	28,570,000	1908	28,850,000
1899	37,460,000	1909	25,415,000
1900	56,820,000	1910	23,825,000
1901	26,970,000	1911	31,499,000
1902	46,625,000	1912	47,825,000
1903	42,626,000	1913	30,900,000
1904	45,360,000	1914	40,505,000
1905	21,310,000		

The average for the five years, 1896-1900, from the above table, is 46,690,000 barrels; the average for the five years, 1901-1905, is 37,178,200 barrels; and for 1906-1910, 28,582,000. It appears, then, that there has been a regular decline in production, the second period averaging 9,511,800 less than the preceding five years, and the years of the third period averaging 8,596,200 less than those of the second. Note, however, that since 1910, every crop has been above the average of the previous five years (1905-1910). The lowering of production may be explained by the fact that until about 1911 practically all bearing trees (94 per cent estimated) were planted previous to 1878, when a low-price period set in and planting ceased. These bearing trees are rapidly going out with age and accident (wind storms, etc.) and a decrease in production, 1896-1910, is to be expected. We have further seen earlier in this chapter that the last period of planting began about 1903, and it is also to be expected that production will increase when these trees begin to come in, about 1910-1913.

Mr. L. J. Steele, in undergraduate work at Cornell University, in the last year, has conducted a questionnaire with nurserymen all over the country. From a great many replies he selected thirty-eight, from twenty-four states, and from these he finds that 17.6 per cent more apple trees were bought for setting 1909-1913 than were bought during the four years previous, 1904-1908, and that the trees purchased in 1913 showed a decrease of 5.3 per cent from the number purchased in 1912. The high planting had been increasing steadily for about ten years up to 1913, when the very bad year of 1912 caused the above 5.3 per cent decrease. 1913 was a good apple year, comparatively, and though figures are not available, probably 1914 plantings increased somewhat over 1913. There is a tendency to let the pendulum swing too far; we go on after evidence definitely shows that apple plantings are hardly the most promising agricultural investment.

The following U. S. census figures are very valuable. There were 120,152,795 bearing and non-bearing trees in 1890, 201,794,764 in 1900, and 217,121,689 in 1910. The maximum was not reached till 1895-1896, and the commercial crop

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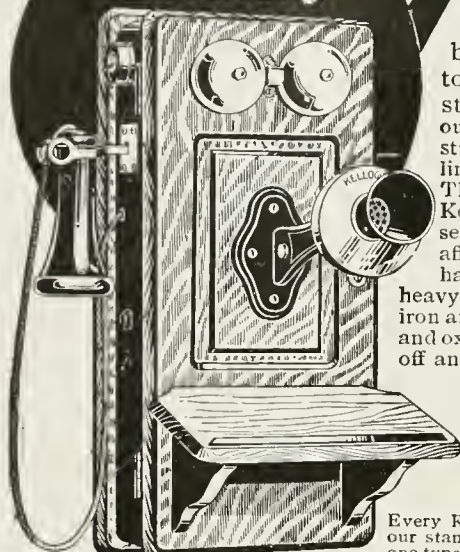
Progressive orchardists, those right down to the minute in methods of protecting heavy laden fruit trees, are agreed that tying branches with Orchard Yarn is the modern way of supporting orchard trees. It is not expensive, is easily done, and the time to tie is when trimming. The spurs are then tougher, less easily broken off than later, leaves are not in the way and all parts of the tree can be seen. Saving but a small percentage of trees from being broken down will pay for the expense of tying an entire orchard. One-ply Tarred Manila Yarn will run about 200 feet per pound. Two-ply will run from 90 to 100 feet per pound. Put up to 5-pound balls or on 10-pound spools. In 5-pound balls the yarn pulls from the inside and is more easily handled.

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decline since has been given; the higher number of trees in 1910 over 1900 simply shows the existence of a larger proportion of non-bearing trees (about 45 per cent). The 1910 crop was but about half of the 1900 crop. The number of farms, the bearing and the non-bearing trees in the United States and in several of the larger producing and more indicative (recent heavy planting) states, are as follows:

TABLE IX. — BEARING AND NON-BEARING APPLE TREES, AND FARMS, 1910 CENSUS

States	Farms	Trees
United States...	2,980,398	151,322,840 bearing
United States...	1,498,746	65,798,848 non "
New York.....	168,677	11,248,203 bearing
New York.....	48,007	2,828,515 non "
Missouri.....	183,396	14,359,673 bearing
Missouri.....	75,035	3,624,833 non "
Washington....	21,156	3,009,337 bearing
Washington....	21,401	4,862,702 non "
Oregon.....	23,850	2,029,913 bearing
Oregon.....	14,327	2,240,636 non "
California.....	19,671	2,482,762 bearing
California.....	12,716	1,054,107 non "
Colorado.....	7,968	1,688,425 bearing
Colorado.....	6,496	1,972,914 non "

Before commenting on these figures, it will be well to submit figures from the same source for 1909 production and value of crops in several crops. Interesting comparisons can be made here. The yield figures are the "agricultural" and not the commercial yield; the latter is usually 40 to 50 per cent of the former.

TABLE X. — BUSHEL AND TOTAL VALUE OF APPLES IN VARIOUS STATES, 1909

States	Busheis	Value
New York (1st).....	25,409,000	\$13,343,000
Michigan (2nd).....	12,332,000	5,969,000
Pennsylvania (3rd)...	11,648,000	5,557,000
Missouri (4th).....	9,968,000	4,885,000
Washington.....	2,672,000	2,926,000
Oregon.....	1,931,000	1,657,000
California.....	1,935,000	2,902,000
Colorado.....	3,559,000	3,405,000
United States.....	116,122,000	83,231,000

Missouri, in 1910, had more bearing trees than any other state, but Missouri apples were worth but about 50 cents, while Washington apples are worth better than a dollar a bushel. In the West, where high value per bushel is shown, there have been the heaviest plantings of late, and there are the largest proportion of non-bearing trees; Washington has half again as many non-bearing trees as bearing trees. In New York there are about 127 trees to the farm, while in Washington there are over 200 trees to the farm. This last is important, for the question of small versus commercial producers will be a vital one in the future competition. Nearly half the farms of the United States (46.9 per cent) reported bearing apple trees in 1910, but a very large proportion of these are only kitchen orchards or are used as such except in years of specially good apple prices. Though there was a decline in total production of 16.7 per cent from 1899 to 1909 ("agricultural") crop, census figures, production increased in 30 states and decreased in but 18. The largest increases in production were in Missouri, Michigan, Colorado and California, and the largest decreases were in Ohio and Pennsylvania.

Definite apple statistics on Northwest plantings are conspicuously lacking, but in this connection the following opinion of Mr. Sheperd, the editor of "Better

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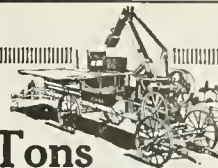
Fruit," in a letter to the writer, December 5, 1914, should be of much value:

"The crop of 1912 was about 12,000 cars; in 1913, 8,000 cars; and in 1914 will be about 12,000 cars. It is impossible to get an average price for the reason that no such figures have been compiled. Different marketing concerns in different places, different varieties and different grades and sizes, present such a variation that no one has ever attempted to figure out an average price, and without such a record being kept, the average price could not be compiled. In 1912 the average price was somewhat under \$1.00; in 1913 it was considerably over \$1.00 for all varieties, grades and sizes. It is a little early (December 5, 1914) to make a guess on this year's prices, but I assume the grower of good varieties in good districts will probably receive somewhere around \$1.00, although it may be somewhat less. The acreage in the Northwest has been estimated at about 500,000 acres in apples. About 20 per cent of this is estimated to be in full bearing last year. Probably 10 per cent to 20 per cent of the balance would come into bearing annually. A prominent official in the Department of Horticulture in Washington, D. C., informed me when I was there in 1910, that only between 10 and 20 per cent of the fruit trees planted in the United States ever made commercial orchards. Old nurserymen tell me the same. Therefore the average would be about 15 per cent. Assuming the Northwest would do quite as well as the average, that would be about 30 per cent, which would mean that perhaps 150,000 acres out of 500,000 acres in the Northwest would make commercial orchards. If 20 per cent of the bearing acreage is in bearing, that would be about 100,000 acres, and if 12,000 cars were shipped, it would mean that if the whole acreage came into bearing as it did in 1914, the output of the Northwest would be about 50,000 cars. A few years ago various newspaper men and railroad men began to figure on the production of the Northwest, taking the number of acres at so many trees to the acre, producing so much to the acre, and estimated. If I remember correctly, the crop in 1915 would be 50,000 cars and in 1920 150,000 cars. I honestly believe that it will be a long time before the Northwest will exceed 50,000 cars. If we are to have 50,000 cars in 1915, and only 12,000 cars in 1914, we have to go a good deal faster in increasing the production in the future than we have in the past."

Apples produced in other countries affect only our foreign market, and important as this is, especially to high grade fruit, only 7 per cent to 10 per cent of our commercial crop is exported. We will consider foreign production later, under the head of foreign markets.

We have now gone over the plantings of apple trees; they are very large and have been increasing, and further, to again quote G. F. Warren, in "Farm Management," "There is no shortage of apple land, most of the tillable land in

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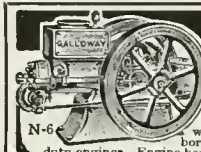


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the United States is well adapted to the crop." What will then be the fate of existing plantings? The question resolves itself into one of competition. Apples must be produced, and the individuals and communities that can produce the required grades of fruit at the least cost will outcompete others. Montana and Colorado districts cannot avail themselves of the Panama Canal all-water shipments to the East and to South American and European markets, as can, for instance, Hood River, Oregon. That is, of course, not the only factor in competition, and it may or may not be the deciding one, but this factor gives Hood River an advantage, and it is just such factors as this which will determine the survival of the most fit. To quote Mr. Shepard again: "An elimination process is going on. There are some sections in the Northwest where apples cannot be grown of sufficient quantity and flavor, color, keep and perfection to justify Eastern shipment. Such sections, as you can readily understand, must necessarily pass out. Blight is another factor in wiping out an immense area already set to apple trees. Large tracts set by promotion companies to be sold on 10-acre plan in some instances have already passed out. Others are passing."

The general opinion of men with whom the writer has talked is that the best apple districts will produce the future apples and that the small grower in the less favored districts will have to be content to supply his own table. New England corn cannot compete with Iowa corn because it cannot be raised as well in New England—the soil and climate are an insurmountable handicap to New England. The writer is convinced that the same thing will evolve out of the heavy future crops, and he sees no reason why the best farmers of the New York growers, of the Virginia growers, and even of the North Pacific growers, may not continue to operate their orchards at a normal profit over a period of years, while the cycle juggernaut is forcing out all the absurd recent, steep-hillside, poor-soil, and out-of-the-way plantings; forcing out, let us say, thousands of acres in poorly favored Missouri.

(To be continued)

Famous Scientist to Speak

Bacterial diseases of California fruits; proper cultivation and the treatment of soils; causes that hinder potato production, and the remedy for blights and fruit pests, will be a few of the subjects which will come up for consideration at the Exposition convention of the California State Fruit Growers' Association at Stanford University during the last week in July. Many famous agricultural scientists and experts have accepted invitations to read papers and make speeches on these and other topics of great interest to the thousands of orchardists throughout the state. A feature of the sessions will be a symposium on the outlook of the various fruits grown in California, by men who have made a notable success of their

culture. Pear blight, which is laying a heavy hand on the orchardists, will be treated from the bacteriological point of view by scientists who have made a special study of the subject.

Mrs. Lillian D. Clark, of Berkeley, will have charge of the women's sessions, where many problems in home economics will be considered. Matters of special interest to the various county horticultural commissioners and inspectors will occupy the attention of the delegates Monday and Tuesday, July 26 and 27, while the following day will be devoted to a tour of the famous Santa Clara Valley. Saturday, the convention will adjourn and go to the Panama-Pacific International Exposition at San Francisco, to view the great plant exhibits in the Palace of Horticulture and to take part in the Horticultural Day ceremonies on the Exposition grounds. In the evening of that day Dr. John Coulter, of Chicago University, will deliver an address. Many hundreds of the leading orchardists and farmers of the state have already notified the convention arrangements committee of their intention to be present. In all, 825 conventions will meet in connection with the Exposition by the Golden Gate, and of these, 74 are devoted to farm and rural interests. Visitors are welcome.

Live Irrigation Data

In a booklet recently issued by Fairbanks, Morse & Co., of Chicago, irrigation projects in many parts of the United States are attractively illustrated and briefly described. The plants shown therein are supplying water to land growing crops of beets, wheat, alfalfa, rice, corn and potatoes, and the land irrigated is located not only in the semi-arid tracts of the West, but in the Southern and Eastern states. One of the larger tracts mentioned is located in the beet raising district of Southern Kansas. To the land irrigated a 60-h.p. Fairbanks-Morse oil engine belted to a centrifugal pump delivers about four million gallons of water per day. The use of this water resulted in the yield of nineteen tons of sugar beets to the acre. A very good idea, both of the machinery used and the character of the soil irrigated, may be gained from the text and illustrations in this publication, which is entitled "Practical Irrigation by Pumping." It will be supplied by the publishers free of charge to those interested.

Holt Wins Nine Big Awards

The Panama-Pacific Exposition announces the award of two grand prizes, five medals of honor and two gold medals on farm machinery to The Holt Manufacturing Company, of Stockton, California. All these awards indicate scorings of 95 per cent or better. Grand prizes are given on the Caterpillar tractor and the Holt combined harvester. Medals of honor, next in rank, are awarded for the Caterpillar disc engine plow, Caterpillar moldboard engine plow, Caterpillar disc harrow, Caterpillar wagon and Holt wood bar engine

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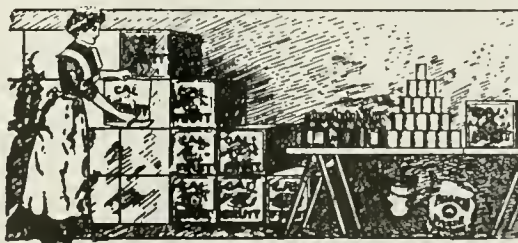
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SOUTHERN PACIFIC

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

harrow. The Caterpillar land leveler and Caterpillar sagebrush plow receive gold medals. Every type of machine or implement entered by the company thus received conspicuous recognition. The Holt exhibit is one of the largest in the Palace of Agriculture, and with the outdoor display it occupies a larger area than any other single agricultural exhibit. Intelligent care in planning the display and a liberal expenditure in carrying out the details have made it a distinct feature of the Exposition. The rules of award recognize not only the exhibit itself, but the company behind the product, the world-wide distribution of the product itself, its civilizing influence, and other factors that bear a deep significance.

Fire at the Bean Plant

The Bean Spray Pump Company, San Jose, California, on the morning of May 29th had a very serious fire, causing \$50,000 damage. The offices, drafting room and a portion of the machine shop were burned. The company will not be delayed, however, in the filling of orders, as their branch at Lansing, Michigan, will be able to take care of their Northwest and Central West business, and their branch at Fresno, California, will supply Pacific Coast points until the San Jose plant is in working shape again. A large part of the machine shop was undamaged and was running the afternoon of the fire. A temporary office was established while the fire was still burning, and the officers of the company state that though they work under considerable inconvenience for some time, business will be continued as usual. The loss was covered by insurance, and plans are already under way for the construction of a larger building and better equipment in place of that which was destroyed. This concern is well known as manufacturers of spraying outfits, centrifugal pumps and gas engines, and it is interesting to know that they will not be seriously set back by the fire.

West Wenatchee elected the following men to serve in their unit of the Fruit Growers' League as directors: Ed Dennis, E. G. Pogue, Carl Jones, W. E. Reeves, and C. F. Kiser. T. F. Roddy was elected delegate to the central body. The League decided not to engage in any form of commercial business this year but to confine its efforts towards the establishing of a uniform pack and to assist in the general supervision of selling agencies. The League has already 300,000 boxes of fruit signed up and a strenuous campaign is being conducted for additional tonnage.

Mr. C. T. Haskell has resigned as Chairman of the Wenatchee North-Central Washington Fruit Growers' League and Mr. J. B. Adams of Leavenworth has been elected Chairman of the Board of Control in his place. Mr. Adams has a reputation for being a wonderful executive and a splendid organizer, one of the strong men of the Wenatchee district with an im-

mense acquaintance and a large circle of friends.

The unit membership of fee to fruit growers will be \$1. Salaries for all officers in the League and in the League and in the Board of Control will be \$5 per day and expenses when actually engaged in the business of the League.

An Engine on the Farm.

Gasoline engines are being put to many interesting uses, being important factors in creating efficiency and economy in farm management. Gasoline engines are taking the place of horses in many ways, being used for power tractors and serving additional purposes such as furnishing power for driving feed cutters, pumping water, running spray out-fits, etc. They are serving a new purpose with the fruit-growers in furnishing power for running the apple-grading machines and sizers, which are being used universally by orchardists. By the use of sizers and graders the grower has found that he can pack his crop more efficiently, more economically, more uniformly and better.

One of the most interesting and instructive stories on the State of Utah, written from an agricultural, horticultural and livestock standpoint, entitled "The Lands of Utah," has just been issued by the passenger department of the Denver & Rio Grande Railroad. The subject matter prepared by Dr. E. G. Peterson, director of agricultural extension of the Utah State Agricultural College, vouchsafes its reliability and authenticity. The illustrations, of which there are many, have been chosen with care and cannot but impress the reader of the great agricultural resources of the state. Under the caption "Gleaned Facts New Settlers Should Know" are given the answers to questions the seeker of a home wants first to know about a prospective location. The Carey Act projects in Utah are described and classified.

The Panama-Pacific Exposition.—All fruit growers who can spare the time to attend the Panama Pacific Exposition at San Francisco and also the San Diego Panama Exposition should do so, because these two expositions are the most wonderful that have ever been held anywhere in the United States. As the Pacific Coast is a fruit country, special attention is being given to horticultural exhibits, which will provide the fruit grower an opportunity of making many observations and acquiring a great deal of knowledge which will be of much value to him in his business.

Prof. V. I. Safro, formerly Assistant Entomologist at the Oregon Agricultural College, now associated with the Kentucky Tobacco Company, has just issued a very interesting booklet, "Nicotine Sulphate Bordeaux Combination."

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Paint No Cure for Fire Blight

Mr. F. E. DeSellen, County Fruit Inspector in Yakima, calls the attention of the fruit growers to be on the lookout for blight during the season. He states that some growers have an idea that paint is a cure for fire blight, but everybody who knows anything about the orchard business knows that no preventative or no cure for blight has ever been discovered. There is only one treatment to get rid of fire blight, that is to cut it out. In the cutting out process extreme care should be taken to cut below the blight infection, and after each cut the knife, pruning shears, or saw, with which the cutting is done, should be disinfected before making another cut.

Apple Crop 40,505,000 Barrels

The American Agriculturist, in its final apple crop estimate for the year, gives the commercial apple crop of 1914 for the United States as 40,505,000 barrels. This is considerably below the Government estimate put out in September of 70,000,000 barrels, which many people claimed at the time was entirely too large. The estimate of the crop in the different sections is given as follows:

1914—	Barrels
New England	3,620,000
Middle States	17,140,000
Central West	5,375,000
Far West	5,070,000
Southern States	6,000,000
All other	3,000,000

Total 40,505,000

1913—	Barrels
New England	2,520,000
Middle States	12,010,000
Central West	5,500,000
Far West	4,170,000
Southern States	3,700,000
All other	3,000,000

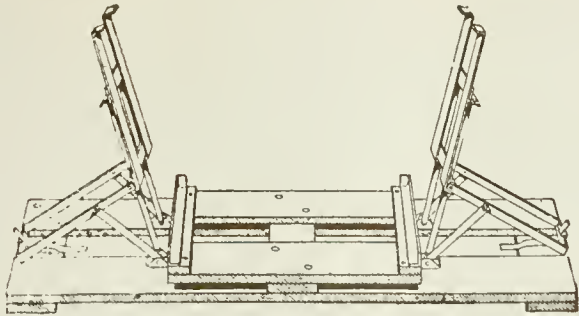
Total 30,900,000

1912—	Barrels
New England	4,100,000
Middle West	18,400,000
Central West	8,500,000
Far West	6,025,000
Southern States	7,200,000
All other	3,600,000

Total 47,825,000

Mr. W. King, who has charge of the hydraulic department of the Berger & Carter Company of San Francisco, who are Western representatives for the Hydraulic Press Manufacturing Company, of Mount Gilead, Ohio, will be in the Northwest about August 1, with headquarters at Berger & Carter Company's office, 406 Pacific Building, Seattle, Washington. This will offer an opportunity for fruit growers who are figuring on doing some cider and vinegar making this year to pick up some considerable knowledge and information about this work.

The Sebastopol Apple Show will hold its sixth show at Sebastopol, California, August 14. Secretary J. P. Kelly, formerly of Portland, Oregon, reports that this show will be the greatest success of any that has been held. Already many exhibitions have been promised and the fruit is a splendid quality, indicating that the show will be a marvel this year.



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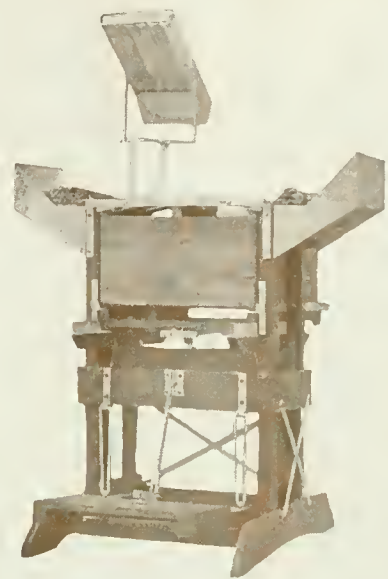
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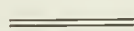
and apply it according to the specifications of our specialists who have had fourteen years' experience with these problems. They will recommend the use of LITH, LINOFEELT or FIBROFEELT, whichever is best adapted for your requirements, and will send you plans of construction. Our insulation is used in lining the largest cold storage plants and by the leading refrigerator transit railroads. Nearer home we have furnished plans and insulation to C. A. Congdon and the Fruit Growers' Warehouse Company, both of North Yakima, Washington.

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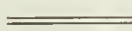
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The World

BETTER FRUIT

VOLUME X

SEPTEMBER, 1915

NUMBER 3



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AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Pruning—Plant Physiology as Related to Pruning

By W. M. Atwood, Associate Professor of Botany, Department of Horticulture Experiment Station, Oregon Agricultural College

[INTRODUCTION.—The Department of Botany, in co-operation with the Division of Horticulture, has prepared this treatise on pruning. Dr. Atwood of the Department of Botany preparing the chapter on Plant Physiology as Related to Pruning. The Division of Horticulture has been working for a number of years on research problems related to pruning. As this work is in the preliminary stages, it will be a number of years before a complete report can be made. However, in the various papers in this article we are presenting a few of the facts which we have been able to determine, coupled with observations that have been made in various fruit-growing districts.—C. I. LEWIS, Chief, Division of Horticulture.]

FOR the orchardist most correctly to deal with the problems confronting him, it is necessary to have a clear idea of the complicated "living machinery" upon which he is dependent for profit or loss. It is worth while to know how the tree removes from the soil the substances it needs; how it manufactures its food, and finally how both the complicated food materials and water are distributed and used by the tree. The knowledge of a few facts of this nature is the necessary foundation on which is being built the successful practices of the practical fruit grower of today.

If the finest terminal roots of most living plants be carefully examined there is found on their surfaces a fuzzy growth resembling fine hairs. As the root is the region in which the plant absorbs the water and minerals of the soil, it is evident that this absorbing region of the root—the root hair region—must tremendously increase the absorbing area of the root. Figure 1 shows a young root with the root hair zone well developed. These fine outgrowths of the root enable it to get into very intimate contact with the finest soil particles which contain necessary minerals and which are surrounded by films of soil-moisture that become available to the plant. The necessity of carefully guarding the root hair region of trees from injury so far as is possible is emphasized by the behavior of any young tree upon transplanting. Figure 2 shows the way in which a twig of a pine tree was affected by transplanting. It is evident that in

transplanting, the tree loses a large percentage of the finer roots, and hence of the most active water-absorbing tissues. The region where the needles were so noticeably shortened is the region

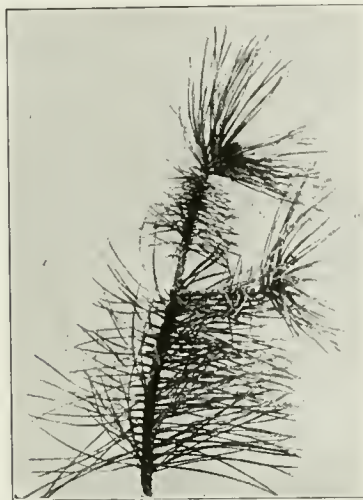


FIGURE 2. Effect of transplanting upon water supply. Short needles produced after transplanting. (After B. M. Duggar, "Plant Physiology." Macmillans.)

which developed immediately following transplanting and before the pine had been able to develop new water-absorbing root tissues. It thus becomes perfectly clear why the orchardist when purchasing trees from a nursery never leaves a large leafy top after first setting out the young tree. Temporarily the young tree is less able to supply its leaves with water than previous to its removal from the nursery. The judicious cutting back of the top for a little while enables the tree soon to develop its root system back into balance with the top.

The root hairs do not absorb water from the soil as a sponge or blotter takes up water when placed in a wet place. If a root hair is examined under a microscope we find that inside the

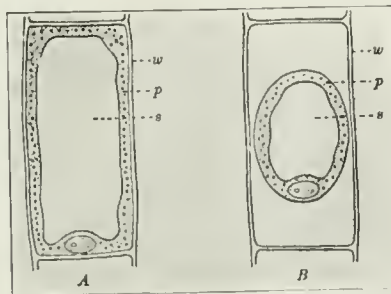


FIGURE 3. Root Cells. "A," in normal condition; "B," cell deprived of its normal water. (After Bergen and Davis, "Principles of Botany." Ginn & Co.)

[Editor's Note.—This is the first of a series of articles covering completely the subject of "Pruning" that will appear in "Better Fruit." "The Study of Fruit Buds," by E. J. Kraus, will appear in the October edition. "Pruning Young Trees," by Professor C. I. Lewis, will appear in the November and December issues. "Pruning the Bearing Apple and Pear Tree," by V. R. Gardner, will appear in the January issue. "Pruning the Bearing Prune Tree," by V. R. Gardner, will appear in the February issue.]

thin outer wall there is a lining of the jelly-like living substance called protoplasm, which is present in all animals and plants wherever there is life. Water tends to be taken into the root hair by a force called osmosis. When pure water is separated from the cell substances by the thin film of protoplasm, we find that the water can readily enter but the substances within the hair cannot get outside of the protoplasm. The law of osmosis is that when two liquids



FIGURE 4. A swamp enduring tree, the Cypress (*Taxodium distichum*, Rich.) Note the root projections or "knees" above the water surface. (After Bergen and Davis, "Principles of Botany." Ginn & Co.)

of different density are separated from each other by protoplasm which permits the passage of the less dense only, the less dense liquid moves in through the protoplasm into the more dense liquid. There would be no object in here explaining this water intake if it did not help to make clear the reason, at least in part, for the unfavorable effects of alkaline soils upon plants. Figure 3 shows at "A" a root cell which is in normal condition. If such a cell is surrounded by a soil sufficiently alkaline, water, instead of moving into the root, tends to move in the opposite direction—that is, it moves out of the root, leaving a collapsed living cell as shown at "B." It is thus possible for a tree to be unable to get needful water in too alkaline a location, even though



FIGURE 1. Seedling of radish showing root hairs. (After B. M. Duggar, "Plant Physiology." Macmillans.)

—must tremendously increase the absorbing area of the root. Figure 1 shows a young root with the root hair zone well developed. These fine outgrowths of the root enable it to get into very intimate contact with the finest soil particles which contain necessary minerals and which are surrounded by films of soil-moisture that become available to the plant. The necessity of carefully guarding the root hair region of trees from injury so far as is possible is emphasized by the behavior of any young tree upon transplanting. Figure 2 shows the way in which a twig of a pine tree was affected by transplanting. It is evident that in

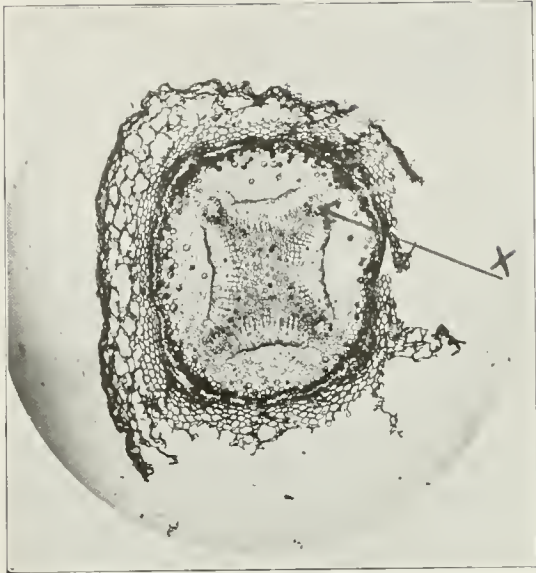


FIGURE 5. Cross section of a young pine root. (*Pinus Strobus*, L.)

moisture be abundant. Fortunately soils of this character are not common.

Before following water from the root hair region in its journey over the tree, one more point must be mentioned. Root hairs, to perform their work of water intake properly, must have a certain amount of air in the soil. If the soil be too wet or "water-logged," injury results to the tree because of the unfavorable conditions imposed upon the root. Only a few trees, such as the cypress (Figure 4), are adapted to meet such as excess of water about their roots. The significance of this fact in orchard cultivation and drainage is clear.

If we cut a thin slice across a root, we are able to see towards its center the water-carrying vessels which take the water absorbed by the root hairs and carry it up to the stem. Figure 5 shows at X the water-carrying region of a young pine root, while Figure 6 shows at X the region in a young vine stem through which the water travels after leaving the root. We can also see in this cross cut of the young stem the cambium region at "C." The cambium is practically the only region in which

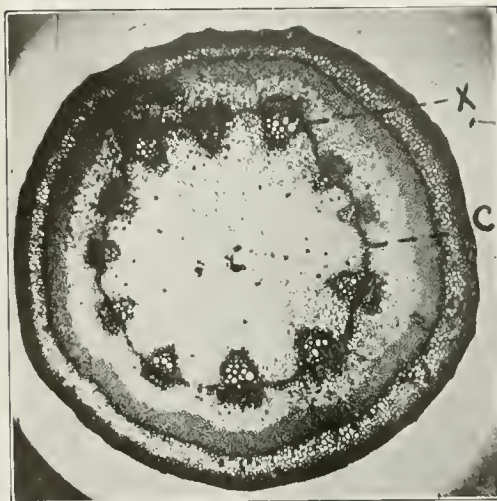


FIGURE 6. Cross section of young stem of "Pipe Vine." (*Aristolochia Sipho*, L'Her.)

any of our orchard trees develop so as to produce increase in diameter of the stem. As this is the only growing region, it is very evident that two grafted stems unite only at this one region, the cambium; hence the care which the orchardist exercises in making the two cambium regions come together.

The cambium lays down new wood each year, the latest wood always of course being the outer layer. The rings we often see running about the stump of a freshly hewn tree are the product of this yearly activity of the cam-

bium. Figure 7 illustrates the yearly rings of a stem, but if we would see more clearly just the cause of the ringed appearance of the wood, we find it necessary to magnify the wood at the region of one of these rings. This



FIGURE 7. Cross section of stem of the Redwood (*Sequoia sempervirens*, End.)

wood or water-carrying tissue, as illustrated in Figure 8, is composed of water ducts or cells. The wood laid down in the later summer is much more dense, as shown at "A," while the early summer wood is more porous and open, as we see at "S." This is partly explained by the fact that the water demands upon the tree are greater in the spring in proportion to the water-carrying tissues present, than later in the summer. The wood of the horticultural varieties, as the walnut (Figure 9) or the cherry (Figure 10), shows the difference in spring and late summer wood a little less conspicuously than Figure 8.

If we follow the ascent of the water up the stem, the two points of destination most of interest perhaps are the buds and the

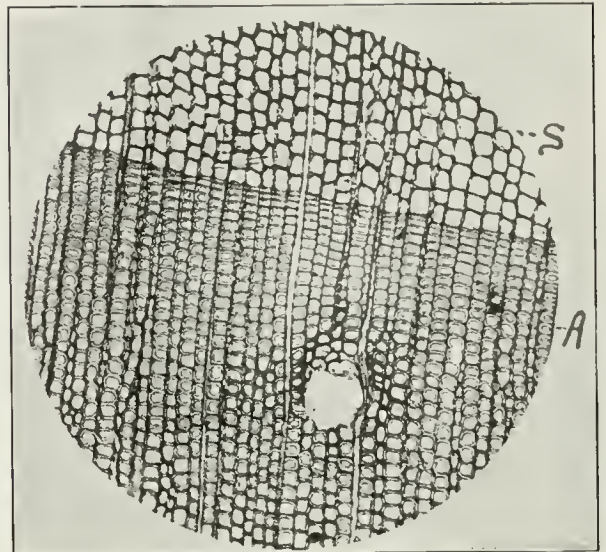


FIGURE 8. Magnified section of wood of the Pitch Pine (*Pinus resinosa*, Ait.) "A," late summer wood; "S," early summer wood.

leaves. Only in so far as water absorption from the root and water transfer through the stem is in normal condition can the young buds far up on the twigs open or perform their work. In the leaf we find the source of the majority of all the food which the plant produces and which enables the tree to grow or produce fruit. A very small proportion of the woody tissues or of fruit tissues are due to the so-called "foods" of the soil, but the large per cent is derived from true foods laid down in the leaves. This makes clear the great injury to an orchard resulting from any factor which reduces the leaf area of the tree beyond certain safe limits. If we cut across a leaf and then look at the exposed edge much magnified, we see something like the diagram of Figure 11. The green coloring of plants is particularly abundant in the leaf, and is located especially in the upper portions of the leaf, which are marked "palisade." On the under surface of the leaf will be seen little openings, one of which is marked

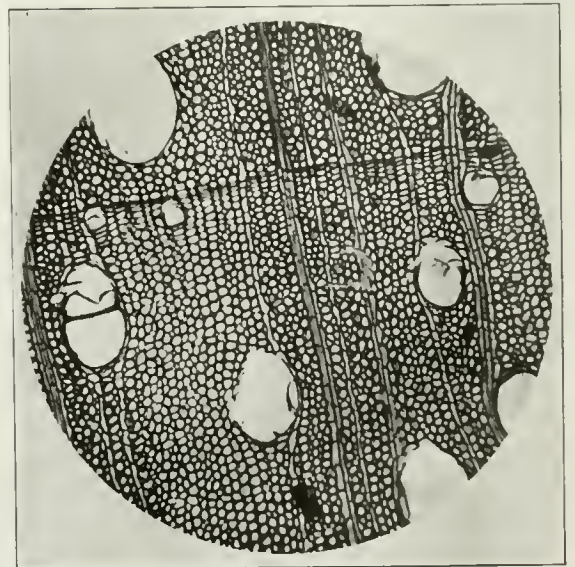


FIGURE 9. Magnified section of the wood of the Walnut. (*Juglans nigra*, L.)

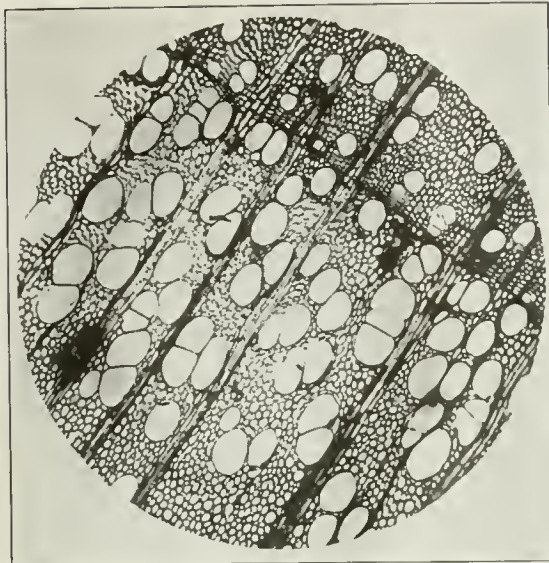


FIGURE 10. Magnified section of the wood of the Cherry. (*Prunus serotina*, Ehrh.)

cut it made parallel and close to the surface from which the limb arises, the wound will be in the best position to intercept the food materials passing down from the leaves through the inner "bark." (See Figure 14.) For similar reasons heading back is usually to a side limb rather than cutting to a bare stub.

From the above facts it should be evident that the growth and thrift of a tree is dependent upon various factors, among which we must include the fertility of the soil, the water supply about

the roots, their condition and development, the care with which the soil has been cultivated, and the character of the leafy top of the tree. The objects which are aimed at in pruning are always more effectively attained if, at



FIGURE 12. Photomicrograph of stomata on the under side of a leaf. (After F. E. Lloyd, "Physiology of Stomata.")

the same time that the top is being artificially altered, we bear in mind the various other conditions which surround the tree, of which we have spoken above, and which are often sufficiently effective to modify or do away entirely with the beneficial effects of the most "artistic" pruning unthinkingly practiced.

The application of these conditions to the problems of pruning in Oregon will be brought out more clearly by the portions of this article which follow.

During the last two or three years growers have been figuring on finding a cheaper receptacle than boxes for low-grade apples to

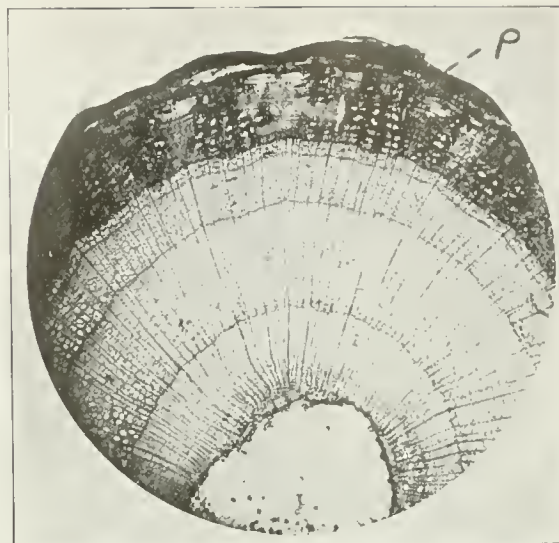


FIGURE 13. Magnified section of the wood of the Linden or Basswood. (*Tilia Americana*, L.) "P," the food-carrying regions of the inner "bark."

be shipped into certain territories. The Western Cooperaage Company of Portland advises us they are getting ready to make quotations on partly made up Government standard apple barrels to submit to the various associations, with samples, showing how they would be shipped. The idea they are working on, they state, is a simple proposition to the packer, as the barrels will be partly made up, requiring no coopering or special labor or tool work of any kind.

South American Markets for Canned Goods

Although South America imports about \$15,000,000 worth of canned goods annually, the United States furnishes only about 18 per cent of the total, of which the principal item is canned salmon. That the sales of canned goods in this field can be greatly increased is the opinion of Commercial Agent E. A. Thayer, of the Department of Commerce, who recently completed an investigation of the Latin-American markets for this line of goods. The results of this investigation are incorporated in a monograph issued by the Bureau of Foreign and Domestic Commerce. This publication treats of the consumers' preferences, sales methods, pure-food laws, credit terms, shipping costs, and other subjects in the various countries of interest to American canners. Copies of this monograph (Special Agents Series No. 87) may be obtained from the Superintendent of Documents, at Washington, for five cents.

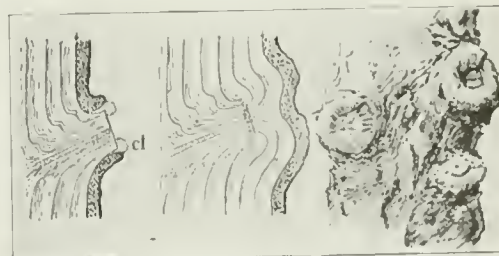


FIGURE 14. Section of a stem to show the method of healing after removal of a branch. (After Curtis, "Nature and Development of Plants.")

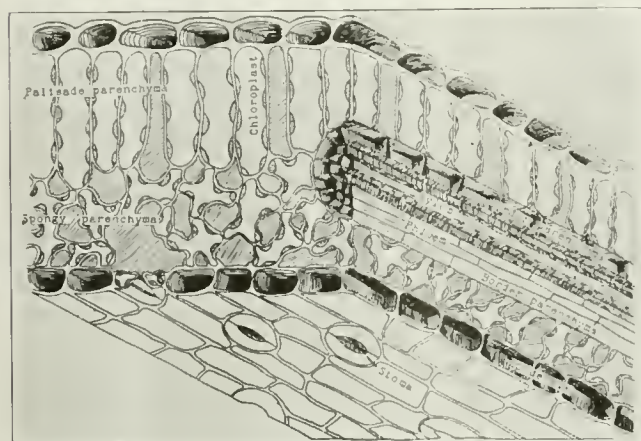


FIGURE 11. Diagram of the cut edge of a leaf to show the regions contained. Magnified. (After Stevens, "Plant Anatomy.")

The Apple as a Farm Product—History and Present Status

By A. Millard, Jr., Hood River, Oregon.

CHAPTER VI.

The Ultimate Limits of Production.

THE ultimate limits of the production of apples may be reduced to two things: the cost and returns of the apple orchard and the consumption of apples. Either heading, in one sense, includes the other, and various headings might be worked out to include or to subdivide one or both of the above, but for the discussion of the underlying principles, these two are as apt as any.

In the previous chapters we have several times hinted at the direct dependence of production upon the profit or loss made by the grower. The principle is simply that apples or any other crop will be produced as long as a profit can be made, and will cease to be produced above the amount that will bring a profit. With a long-time crop, the extremes are true; a very low profit will be accepted on apples before the expensive orchard will be taken out or allowed to "go back," where with potatoes the farmer can next year leave this crop out of his rotation. This is the sum of the only logical conclusion that can be made from any observations of supply and demand in farm products, and the principle can only be amplified. Data on the cost of producing apples that is accurate enough to be used for calculations is not available. The absence of such data is only explainable by the fact that the very important science of cost accounts in agriculture is a new one. Though cost accounts on annual crops have been carefully worked out in detail in New York, Minnesota and elsewhere, dependable figures for the production cost of apples, including the six to ten unproductive first years, will not have been worked out for several years. Estimates are valuable in the absence of such exact data, and the most reliable of which the writer is aware are given here.

For 6.1 acres, containing 234 apple trees of mixed varieties and ages, over a ten-year period, M. C. Burritt, of Cornell University, found the average yearly cost per barrel of apples to be \$1.08. As regards Western box fruit, Mr. Shepard estimates the total harvesting cost of a box as reducible to 30 cents. (Under unfavorable circumstances his own cost was 35.9 cents.) From estimates, Mr. Shepard believes that about 30 cents will cover all cost of growing, from the end of one harvest to the beginning of the next, not including interest on investment. This makes 60 cents as a minimum, to which 35 to 55 cents per box must be added as the water or rail rate to New York. The overhead (interest, etc.) charges that must be added to this varies with the land value, and is best not included here in considering one of the Western orchard communities where land values are so unsettled, descending, as they have, from ridiculous boom prices to an indefinite, much lower status, with not enough land transfers to fix the cost.

Fifty-five or 60 cents, then, plus 35 to 50 cents, gives 90 cents to \$1.10, plus overhead charges, which must be received as wholesale prices in New York before the Western grower can make a profit. With 1912 and 1914 prices very little over \$1.00, and 1913 prices less, we can see that we do not appear to be far from the point at which Western growers can no longer raise apples.

Farmers' Bulletin No. 615, United States Department of Agriculture, gives the following figures on the average price received per bushel by growers the country over. This is interesting, but without other data on the same apples, it is of little value for comparison.

TABLE XI.—PRICES RECEIVED BY GROWERS PER BARREL OF APPLES.

Year	June 15	July 15	Aug. 15
1910	No data	\$0.77	No data
1911	No data	.95	No data
1912	\$1.08	.82	No data
1913	1.01	.86	\$0.68
1914	1.36	.91	.75

Prices are to tend to be at least as low as they are at present—lower prices will tend toward greater consumption, and the pressure of the competition forced by lower prices will cause the lowering of the cost of production. This is the most important phase of the question. The writer has spent the past two summers in Hood River, Oregon, and in that short time has seen the change from the expensive policy of "clean cultivation is the only thing" to a general trend for intercropping and farm diversification. The by-product side of this discussion is a very promising one (Mr. Shepard estimates a saving of from \$10 to \$20 an acre from this source), and the phase of savings in distribution discussed in Chapter II. will undoubtedly have much effect in this direction.

The costs, then, may be lowered, and the returns will be a slight profit of necessity, but the marginal profit will tend to be low. Our conclusion is identical with our first premise: apples will be produced at any profit, and below profit they will not be produced.

The various phases of consumption of apples have been or will be treated elsewhere in this work, and here it is only necessary to sum up the question. To begin with, apples have always been the most popular and the leading fruit in this country, and this is a great advantage to the apple industry. The consumption depends to a large degree upon price, and the prices are to be low, so we can count upon increased consumption from this lowering of prices. There is the most intense sort of competition going on between the various fruits; this will strongly tend against increased consumption of apples. The apple has some advantages over other fruits; oranges cannot be cooked unless jellied, but the rate at which the grape-fruit has been taken up in the last few years is assurance of the mobility of public taste in fresh fruit. The story of the banana, the

poor man's fruit, is discussed in this treatise. Extending consumption by advertising and standardizing promises much within certain limits; these topics are discussed later. Various grades of apples are consumed, and the demand for the most expensive fruit is very limited. Such consumption buys to please its eyes, but the great consumption which affects the whole of the industry is the consumption of the lower grades of fruit. But one other factor need be mentioned. This is the population increase. Increased population means increased markets, but the markets will become none the less competitive.

CHAPTER VII.


What We Have Today.


In this chapter we will take up five of the most important phases of the present apple industry. We will take these up in the following order: Apples, staple or luxury; distributing organizations and individual or co-operative selling; increasing the demand—standardizing and advertising; competition of other fruits; and, finally, the various markets.

Apples are not at all a necessary of food. Fruits are not a necessary of food, since proteins, carbohydrates and fats can be obtained in more concentrated and cheaper forms in other foods. Much less, then, is any one fruit a necessary of food, since any other of many fruits can substitute for it. The query as to whether apples are a staple or a luxury is of no importance. It is not worth settling, since it is but a matter of definition. The farther from a luxury that apples will appear, due to the extent of the habit of their use and to the price at which they are sold, the greater will be the consumption. Apples will appear as a staple if the price is low enough. Bananas are a staple to a great number among our foreign population who have become accustomed to this fruit. Apples are selling wholesale and retail right beside oranges, grape-fruit, bananas and what not, and the price cannot but be an all-important factor to the buyers of these fruits. Elastic demand increases in about direct pro-

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portion; other things being equal, halving the price doubles the demand. Apples are, then, a staple or a luxury primarily as they vary in price, and, excluding the very highest grades of apples, the industry will benefit or suffer (other things being equal again) in proportion as apples are made by their price to appear a staple of the daily public diet.

We have discussed distributing organization of farm products in Chapter II. At this point we will consider something of the same question as it applies to apples. Commission and jobbing, etc., is practiced in the apple trade as outlined in the above mentioned chapter, but co-operative organizations, in as far as they concern apples, merit further discussion at this point. For nearly all examples of successful co-operative concerns, we must look to the far West or to specialized districts in the East. Some little work has been done on co-operative marketing of apples in New York communities, but the movements are not at all well developed. It is in the West only that co-operative apple marketing has been carried on thoroughly enough to give this practice anything like a trial. Mr. G. K. Holmes' statement of the essence of the matter admits of the results and possibilities of co-operative marketing under "good management" and "with conditions which permit success." This system is still on trial, and yet it has gained already such momentum that there must be something back of it. Northwest growers have had local associations and unions for several years, and the 1913-1914 crops were marketed to a large degree under the co-operative body known as the North Pacific Fruit Distributors. The Northwest growers are planning at present a large representative meeting at Spokane in February, 1915, at which it is expected that further marketing schemes along lines similar to those now in vogue will be evolved. Many evils of strict competition were not avoided by the Distributors; in spite of every effort self-competition went on, and over-heavy consignments and under-bidding, etc., all lent a hand in bringing low returns for the 1914 crop. The writer has been told by various men whose judgment should be of the best that the only salvation for co-operative fruit producers was complete pool of produce, with no chance for the insistence on the pick of the markets at certain times by any fruit raising community. This complete pool is without doubt a vital point, but the California Fruit Growers' Exchange has managed without such an absolute pool, the various localities retaining their respective identities, and though the circumstances in California are different, the writer believes that this one factor will not check the movement in the Northwest.

Each grower must decide in these communities whether he is to market individually or with the union or association. If the association is clearly bringing him the highest prices, there is no doubt as to what to do. But when,



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as in many cases, the association does not bring in as good prices as certain individuals receive by standing out for themselves, it is a different question. The writer knows of a group of growers who are associated in a Northwest valley to market their apple crop independently of the local and of the Northwest association. These growers believe that they can grade higher, etc., and so get an earned better price. Is it right to say to these men, "We know you can get better prices selling alone, but we want you to sell through us so that the co-operative idea will gain strength"? The writer believes not. The burden of proof is on the co-operative association: they must prove themselves to be the most advantageous marketing agency before they can be allowed to market all the fruit. The small grower has been forced to join the association. He cannot handle his own marketing, and though the larger owner may believe in co-operation and eventually intend to join the movement, he cannot be logically asked to sell his apples for less than the highest price that they will bring, under any pretense of any motive whatsoever.

Within limits, a great deal may be done in the direction of getting a larger consumption of apples. We will consider this phase of increasing the de-

mand under the heads of standardizing and advertising.

The grading of apples has come from the West to the East. In the West what was then a revolutionary uniformity of pack became a necessity. The Western grower could only sell fruit at top prices to compete with Easterners who did not have the expensive long shipment, and hence there developed in the Rocky Mountain and North Pacific States systems of sizing, grading and packing which have very vitally affected the apple industry. Perhaps the most important function of grading is that in thus standardizing the marketable product there is taken a long step in bringing the consumer closer to the producer. This standardizing has also allowed much of the change from commission to jobbing marketing, and thus accomplished a great deal toward the simplification of distribution. Standardizing has its drawbacks; the Chicago commission men mention some of these, but nevertheless standardization is a most decided advance in agricultural marketing. We cannot accomplish anything by clinging to antiquated methods. We must make what progress we can by adapting ourselves skillfully to the inevitable new systems.

WE WILL SAVE YOU MONEY ON YOUR

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Quality Guaranteed.

Write for Prices and Samples.

THE SIMPSON & DOELLER CO.**E. SHELLEY MORGAN, Northwestern Manager**1423-24 Northwestern Bank Building
PORTLAND, OREGON

We have a fine line of new stock Apple Box Labels. Samples on application.

When the Sulzer bill was before the House of Representatives, the International Apple Shippers' Association prepared a pamphlet in support of the bill, in which they submitted among many other figures, the following tables:

TABLE XII—BARRELED APPLE EXPORTS, UNITED STATES AND CANADA

Five-Year Period	United States	Canada
1882-1887.....	2,351,256	585,277
1887-1892.....	3,115,107	1,480,106
1892-1897.....	3,901,224	2,578,255
1897-1902.....	2,859,628	2,450,101
1902-1907.....	8,151,552	4,353,103
1907-1912.....	1,310,174	5,048,305

TABLE XIII—PERCENTAGES OF EXCESS, U. S. AND CANADIAN EXPORTS

1882-1887, U. S. excess over Canada.....	300%
1887-1892, U. S. excess over Canada.....	110%
1892-1897, U. S. excess over Canada.....	51%
1897-1902, U. S. excess over Canada.....	16%
1892-1907, U. S. excess over Canada.....	87%
1907-1912, Canada's excess over U. S.....	14%

This pamphlet of the Shippers' Association laid the Canadian gains largely to the Canadian Fruit Market Act, which had at this time been in effect some years.

A grading law has been in effect during the present season (1914) in New York State, and although it is too early to pass final judgment upon this it is certain that the first year's practice of the law has not been either an unqualified success or an unqualified failure. The season was not one for fair trial, but decidedly one for a severe trial. There were many complaints, but these came mainly from the smaller growers, who claimed to be unable to pack inside the law without unjustifiable expense, and these growers asked for lower grades and for wider limits in the higher grades. It appears that the law is not strictly enforceable and not being in the "agricultural code." Further, the law was hardly followed out to the letter during this year. The writer inspected several sample barrels of Standard-A Baldwins during December, 1914, on the New York Central pier, New York City, which needed much leeway before strictly falling under the specifications. The present plans are to go on under this law, and it would appear that grading will continue in New York State, but there are many difficulties to be overcome. There has been considerable agitation in New England in regard to apple grading. New England will have every disadvantage and will lack many of the advantages of New

York in putting through a grading measure. Fruit is even more scattered in New England than in New York State, and there is much less of it.

TABLE XIV—SEASONAL FITNESS OF APPLE VARIETIES
(W. S. Thornber, Lewiston, Idaho, in "Better Fruit" for April, 1914)

Variety	Months to Be Used (Season)	Condition	Dessert	Sauce	Baking
Yellow Transparent.....	Aug. to Sept.	{ Unripe { Ripe	Good Excellent	Excellent Good	Poor Poor
Duchess.....	Aug. to Oct.	{ Unripe { Ripe	Poor Excellent	Excellent Good	Poor Good
McIntosh Red.....	Sept. to Oct.	{ Unripe { Ripe	Good Excellent	Excellent Good	Good Poor
Wealthy.....	Sept. to Oct.	{ Unripe { Ripe	Poor Excellent	Excellent Excellent	Excellent Good
Winter Banana.....	Oct. to Dec.	{ Unripe { Ripe	Good Excellent	Poor Poor	Poor Poor
Delicious.....	Oct. to Nov.	{ Unripe { Ripe	Good Excellent	Good Poor	Poor Poor
Jonathan.....	Nov. to Dec.	{ Unripe { Ripe	Good Excellent	Excellent Good	Good Poor
Grimes Golden.....	Nov. to Feb.	{ Unripe { Ripe	Poor Excellent	Excellent Good	Good Poor
Stayman.....	Dec. to Feb.	{ Unripe { Ripe	Poor Excellent	Excellent Good	Good Poor
Spitzenberg.....	Dec. to Jan.	{ Unripe { Ripe	Good Excellent	Excellent Excellent	Excellent Good
White Pearmain.....	Dec. to Mar.	{ Unripe { Ripe	Poor Excellent	Good Poor	Good Excellent
Rome Beauty.....	Dec. to Apr.	{ Unripe { Ripe	Poor Excellent	Excellent Good	Excellent Good
Yellow Newtown.....	Feb. to May	{ Unripe { Ripe	Good Excellent	Excellent Excellent	Good Good
Winesap.....	Feb. to Apr.	{ Unripe { Ripe	Good Excellent	Excellent Excellent	Good Good
Wagener.....	Feb. to May	{ Unripe { Ripe	Poor Good	Excellent Good	Excellent Poor
Arkansas Black.....	Feb. to May	{ Unripe { Ripe	Poor Poor	Excellent Poor	Excellent Good
Ben Davis.....	Feb. to May	{ Unripe { Ripe	Poor Poor	Good Poor	Good Poor

The International Apple Shippers' Association (Rochester) and in the last year or so the Apple Advertisers of America (Baltimore) have done a very considerable work in advertising apples, and they are vigorously pursuing plans for the future. The shippers distributed a great number of booklets on apple recipes several years ago, and they have just lately put on its feet the slogan, "Eat an apple a day—keep the doctor away." Mr. Phillips, secretary of the Shippers' Association, has shown the writer a large book of newspaper clippings on "Apple Day," 1914. The Shippers gave a cup to the city holding the best demonstrations, etc. (won this year by very enthusiastic Cincinnati), and the results of this Apple Day were felt all over the country. The Apple Advertisers work in harmony with the Shippers, and though much newer, the former organization has done a great

deal. Other agencies have done much; growers and dealers. Steinhardt & Kelley, fruit dealers of New York City, have had during this (1914-1915) season very catchy advertisements in the New York City subway and elevated cars, with the "Eat an Apple" slogan over the name and attractive picture of the "Skookum" apple, the particular Northwest brand that they are pushing this year. This advertising has value, and all apple men should support it. There is some danger of waste in the cross advertising of competing brands of boxed apples, etc., but in general the more said about apples the less the public will think about oranges. Any means of causing more intelligent use of apples is also productive advertising. The following table is an example of this; intelligent seasonal consumption of apples means satisfaction and future purpose:

Advertising can hardly create a want, but it can disclose a desire and thereby create a demand. "Sunkist" for oranges is a model for the results attainable for efforts toward a brand, and this has meant thousands of dollars in receipts and many more thousands in prestige to the California Fruitgrowers' Exchange.

There can be no question but that apples compete decidedly with every other fruit on the market, literally from mangoes to hickory nuts. In a previous chapter we have traced the history of the apple industry from the days when it did not even compete with the Mediterranean trade through the period when the apple was practically the only widely consumed orchard fruit. The first California shipment was made in 1867, but only in the last twenty years have oranges been keenly marketed up to the limit of consump-

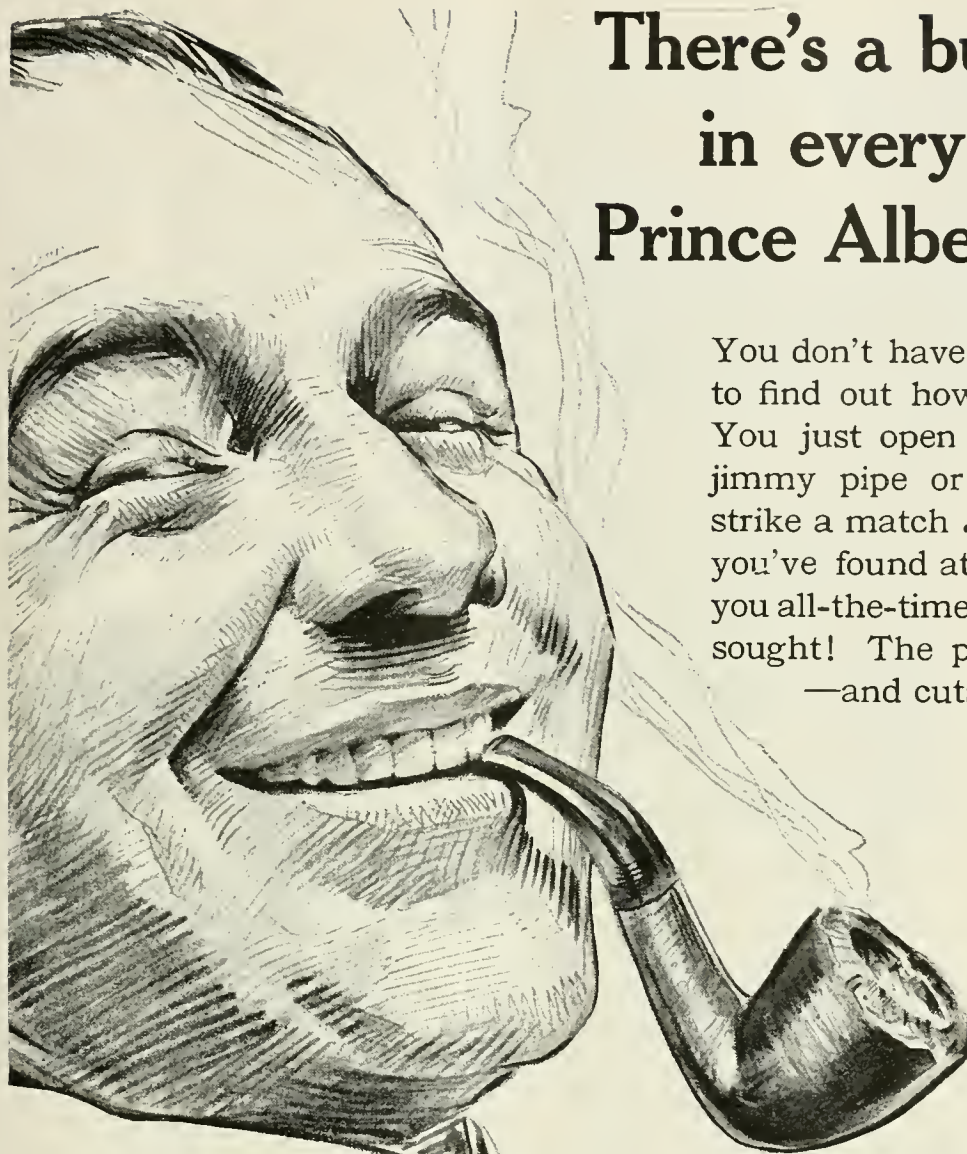
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There's a bunch of joy in every puff of Prince Albert Tobacco

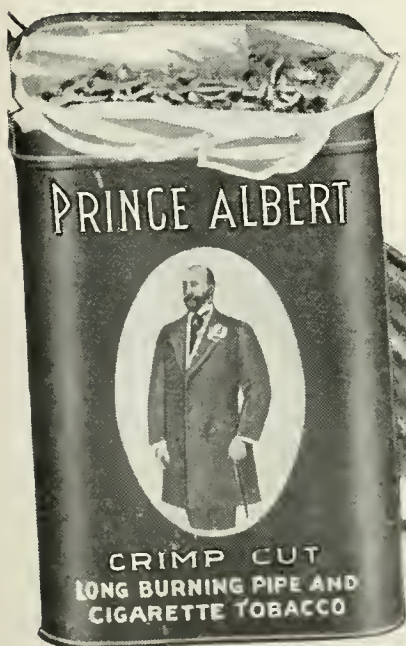
You don't have to call for an encyclopedia to find out how P. A. sets on your taste! You just open up your supply, fill your jimmy pipe or roll a makin's cigarette, strike a match *and-puff-away!* Because, you've found at last the brand that gives you all-the-time the pleasure you've always sought! The patented process fixes that —and cuts out bite and parch!

PRINCE ALBERT

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among tobaccos is like a real man among men. *You can make camp with it on short acquaintance!* Because you know from the first puff *that it is right!* It is a fact that Prince Albert is the friendliest smoke you ever put into a pipe or rolled into a cigarette. What we tell you is government-bond-good. And we say right here that our printed word has never yet struck within 50% of what P. A. will prove out! The heartiest enthusiasm of Prince Albert's friends does not overdraw the pleasure this tobacco *will give you!*

Prince Albert is sold everywhere in toppy red bags, 5c; tidy red tins, 10c; handsome pound and half-pound tin humidors and that classy pound crystal-glass humidor with the sponge-moistener top that keeps the tobacco in such fine condition.

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We shall be glad to give you any general information in regard to the Exposition or side trips upon request.

ALBERT BETTENS, Manager

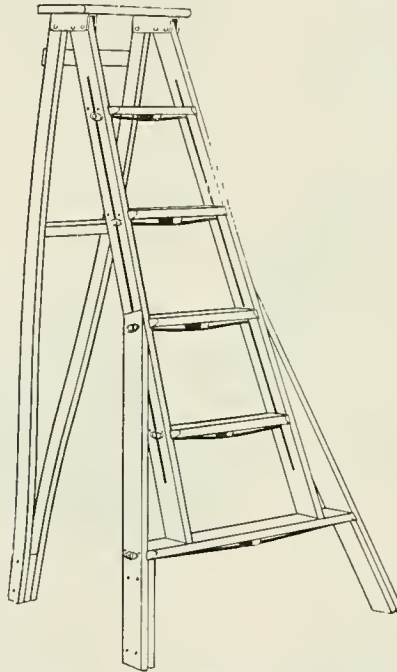
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Made of heavy galvanized iron. Has a canvas sack lining with patented opening and closing device. If you like a picking pail you will want a Barnett.
Price, each \$1.50
dozen lots 16.50

These are but three of the articles shown in our new catalog of orchard and packing house supplies. Write for this catalog. We have the goods you need at the right prices.

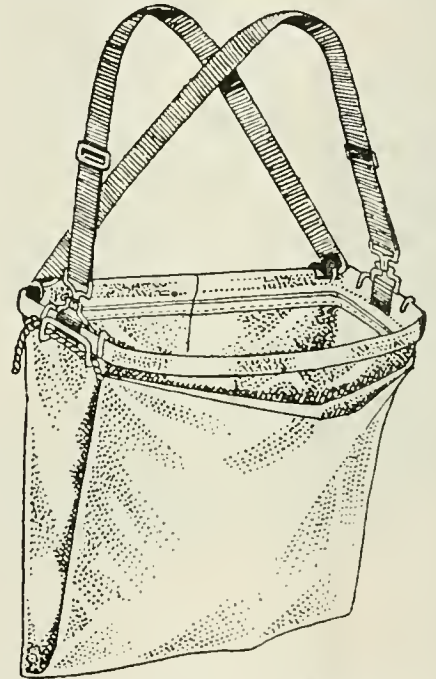
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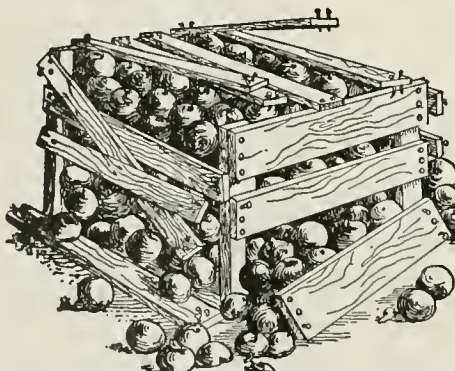
Portland Picking Bag



A strong canvas sack with broad shoulder straps. Does not tire the picker and enables him to use both hands in picking. Easily and quickly emptied. A speedy and economical device for every orchard.

Price, single bag \$1.50
dozen lots 15.00

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BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

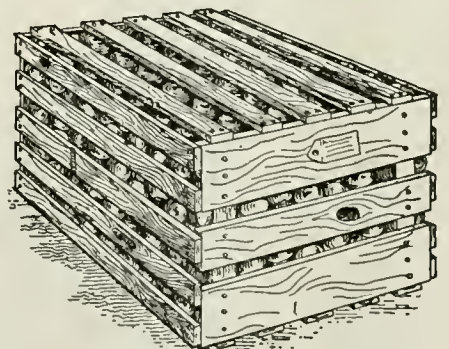
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

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AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

Cause of Carbon Deposits

Lieutenant G. S. Bryan, government expert, in an article in the February issue of the Journal of the American Society of Naval Engineers, says: "Carbon may exist in a motor oil in two forms: First, as free carbon held in suspension, and, second, in combination with hydrogen, forming the numerous hydro-carbon compounds which go to make up the oil. The amount of free carbon in a well-refined oil is very small, and the objectionable carbon deposit is generally due to some other factor.

"The conditions attained in the cylinder of internal combustion engines that result in the formation of carbon are: First, high temperature, and, second, a limited supply of oxygen (air). References have been made to oil 'burning.' This term has been used rather loosely, as strictly speaking, 'burning' means the combining of the vapors from the oil with the oxygen of the air, and does not include simple vaporization of the oil. Unless air is present in excess of that required for the combustion of the gasoline or fuel oil, and usually it is not, the oil cannot really burn. Under the intense heat, however, the inner surface of the oil film will be vigorously affected, and, in the absence of the air necessary for burning, three things may happen: Case 1. The compounds may volatilize with decomposition. Case 2. The compounds may decompose with the formation of free carbon and hydrogen. Case 3. The compounds may decompose with the formation of other hydro-carbon compounds of a different nature.

"The products formed in case 1 give no trouble, as being gaseous, they are carried out with the exhaust, whether burned or not. Of the products formed

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Our new catalogue is nearly ready for distribution.

The "Motion Picture Booklet" may be had for the asking.

You will be glad to get the regular numbers of the "Yuba Bulletin."

Fill in the coupon on page 20, send it to The Yuba Construction Company, 433 California Street, San Francisco, which insures your being up-to-date on the tractor question.

THE SHOTWELL Box Marking Machine



This machine patented May 11, 1915.
Patent No. 1138985.
Any infringement will be prosecuted.

Is designed to print all the stamps required on a box of apples or other fruit at one stroke, in perfect alignment, saving time and labor. The machine prints the box to look as follows:

125 EXTRA FANCY WINESAP 40 LBS. NET JOHN DOE
WENATCHEE, WASH.

It eliminates untidiness and unevenness in marking.

Saves time in picking up five different stamps separately, as all these stamps are placed on a wheel and the entire marking of the box as shown above is done in one movement and as quickly as one stamp is put on by the old method. The machine works automatically and is self-inking.

The Shotwell Box Marking Machine is a device that saves labor, does it neatly with dispatch. Made to be attached to any open end press and can be adjusted to mark any standard fruit box of any variety, apples, pears, peaches, oranges and lemons, etc.

It is made of malleable iron, assembled ready for use.

With each machine is included, without extra charge, eighteen number stamps, three grade stamps, one net weight stamp, one two-line grower's address stamp, ten variety stamps and an ink pad. Price, neatly packed ready for shipment, \$15.00, f.o.b. Wenatchee, Washington.

Ready for delivery July 15. Order promptly, as only a limited number will be assembled this year as orders are taken. For full descriptive illustrated catalog and further particulars, write

Shotwell & Wilmeroth
WENATCHEE, WASH.

Northwest Fruit Ladders

Not excelled by any Fruit Ladder
on the market

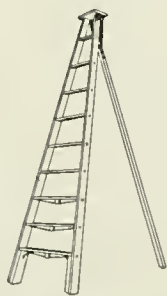
We use Air-Dried Spruce Lumber. Rods under each step.

Price of ladder will surprise you. If your dealer does not sell the Northwest Fruit Ladder write us for prices and circular before buying. You will save money and get the best ladder.

Also Step Ladders

Northwest Fence and Supply Co.

Station A, Portland, Oregon



THE IMPROVED HOOD RIVER BOX NAILING PRESS

Is the Best Device of its
kind for the industry
on the market.

The fact that Hood River growers by the hundreds use them, is our best testimonial.

And those who have had experience with the press are satisfied; for by the elimination of box bruises it has aided in making the Hood River apple famous.

If you are in the market for a Nailing Press, it is to your advantage to investigate the HOOD RIVER PRESS and get our prices.

W. G. SNOW
Hood River, Oregon



Cold Store

Your apples and feed out to the consuming public as the market demands and prices suit.

California apple crop 1,500 cars short this season.

Los Angeles, the great distributing center of the Southwest.

Why not ship to this market?

The things you will most want to consider in selecting a warehouse to cold store your apples:

Character and Responsibility of Company.

Location of Warehouse.

Capacity of Warehouse.

Equipment.

Handling of and caring for fruit.

Rates.

The question of CHARACTER and RESPONSIBILITY is very important and we take pleasure in stating it is these very things that have made it possible for our Company to operate the largest cold storage warehouses on the Pacific Coast.

LOCATION of our warehouses, near the Public Markets, direct connections with all railroads; switching facilities unexcelled.

Combined CAPACITY of our two plants is 1,000 carloads.

Both plants are EQUIPPED with all modern improvements which practice has taught us to be the best.

All goods are HANDLED by men who KNOW and DO IT.

We are everlastingly particular about the temperatures of the rooms, they being taken regularly and carefully verified.

Our RATES are reasonable.

Write us about this market; we are constantly accumulating data for just this purpose. Feel free and welcome to write us about anything pertaining to the production or marketing of your fruits, and if we don't know, we will find out for you, if possible.

Los Angeles Ice and Cold Storage Co.

Main Plant and Office, Seventh Street and Santa Fe R.R.

P. O. Box 643 Station C

LOS ANGELES, CALIFORNIA



BRANCH
PLANT

CORNER
FOURTH
STREET
AND
CENTRAL
AVENUE
SOUTHERN
PACIFIC
TRACKS

under case 2, the hydrogen would pass out of the exhaust, whether burned or not. The carbon may be blown out with the gases, or may remain in the cylinder. Whether or not it remained in the cylinder would depend greatly on the condition of the oil film on the cylinder walls. Some oils form a thick, viscous, gummy deposit which retains the carbon formed on its surface and prevents it from being blown out through the exhaust. This gummy deposit gradually gets thicker and harder, eventually forming the hard carbon deposit so well known in cylinders. This gummy deposit is due to the action of the compounds mentioned in case 3. The free carbon liberated in case 2 is light and fluffy and of itself would not form the hard deposit. Where the compounds break up into new compounds, however, some of the new compounds are volatile, while others are heavier and more viscous than the original compound. Continued action of the kind mentioned in case 3 will therefore result in the gradual thickening of the film, and the retention and absorption by the film of the carbon that is liberated will increase this effect until, finally, a hard, brittle deposit results.

"In the absence of any gummy deposit of this kind to cement the free carbon together, the latter will generally be blown out through the exhaust. The oil that will give the best results, then, is not necessarily the one that will form the least carbon, but the one that will form the least carbon in the cylinders. Oils made from asphalt-base crudes have shown themselves to be much better adapted to motor cylinders, as far as their carbon-forming proclivities are concerned, than are the paraffine-base Pennsylvania oils."

The loganberry growers of the Willamette Valley shipped the first carload of loganberry juice East in the month of August. Loganberry juice has become a very popular drink and has been pronounced one of the pleasantest of all fruit-juice drinks. Fifteen hundred gallons were given away by the loganberry growers of the Willamette Valley at the Panama Exposition in San Francisco. It is prophesied that when the public becomes well acquainted with loganberry juice, as they are with grape juice, that it will command a sale equal, if not greater, than grape juice.

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Apples stored with us take in transit rate and quick delivery to

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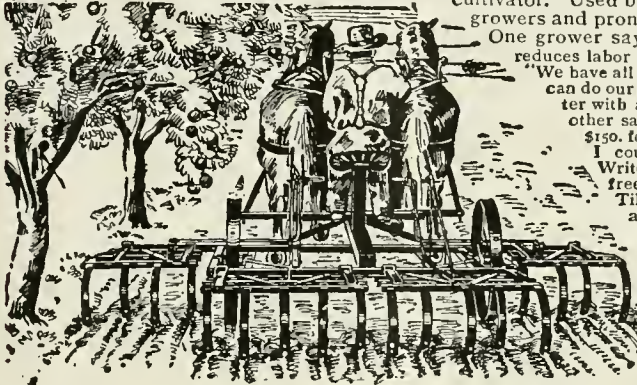
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Lockport, New York

FORKNER SPRING TOOTH TILLERS

WORK RIGHT UP TO YOUR TREES

Cultivate entire surface between rows without disturbing boughs or fruit. Does more work—easier and quicker—and leaves better surface mulch than any other cultivator. Used by thousands of fruit growers and pronounced *indispensable*.



One grower says: "The Forkner reduces labor 40%". Another says: "We have all kinds of tools, but we can do our work quicker and better with a Forkner". Still another says: "I wouldn't take \$150. for my Forkner Tiller if I couldn't get another". Write today for catalog and free book—"Modern Soil Tillage"—invaluable to any farmer or fruit grower. Mailed free. Write today.

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Western Pine Box Sales Co. 10c for Three Months

HIGH GRADE FRUIT BOXES
APPLE, PEAR AND PEACH BOXES
Fruit and Vegetable Crates
GOOD SERVICE—Write us
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Trial subscription to leading fruit and garden publication. Gives timely information each month. Eighteen years old. Regular subscription rate \$1 for three years. Address

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PONY EXPRESS RACES
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Furious and Exciting
New Contestants for Glory
Old Champions, man and
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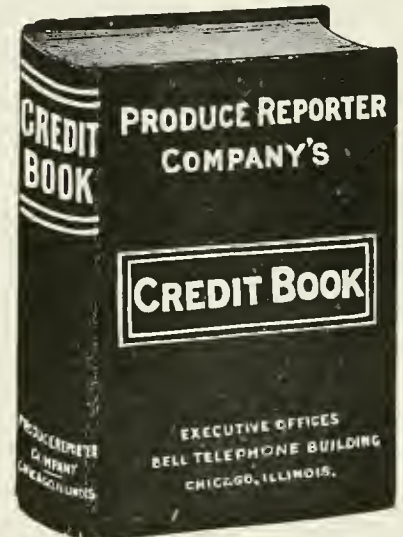
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BUILD UP YOUR OWN
SHIPPING BUSINESS

The **Credit Book** guides you to reliable, responsible buyers—points out the "tricky" and "unfair" dealers—gives the summarized experiences of other shippers with every firm in every market. It is used today by the great majority of successful fruit and produce handlers.

Our Inspecting and Adjusting Department looks after rejected or complained of shipments—Adjusters located in all principal markets. Collections, Litigations, Railroad Claims promptly, efficiently handled for members.

Produce Reporter Service operates on the correct co-operative principle for the mutual benefit and protection of members—it enables the smallest shipper to profitably compete with the largest "Distributor." It affords the only practical solution of your problem—write us today for full information—you incur no obligation whatever in doing so.

Produce Reporter Co.

NEW YORK Fruit Trade Building CHICAGO Bell Telephone Building

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
Made Payable to

Better Fruit Publishing Company

E. H. SHEPARD, Editor and Publisher

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Canada and foreign, including postage, \$1.50

ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

The Apple Crop of the United States, the Northwest in Particular.—Men who are engaged in the apple business and others who are not, but who are well posted, remember the boom that existed in the Northwest a few years ago, in fact throughout the United States. The boom collapsed in 1912. Since that time there has been no extensive planting of apple trees anywhere in the United States, with the possible exception of some promotion work being done in the State of Virginia. In the meantime a large number of people have found out that much land has been planted to apples where neither good varieties or quality can be produced, therefore a large amount of this acreage is being dug up, not only throughout the Northwest but in other sections as well. The planting of 1912, in 1920, will all be in bearing, being eight years of age at that time; therefore the maximum of production could be expected in 1920. As a matter of fact it is the editor's opinion that the maximum production will be reached before that time, probably in 1918, for the reasons, as already indicated, that large acreages are being dug up that are not adapted to fruit growing and are being planted to something the district can produce to advantage. In addition to this many varieties of apples have been planted in districts where the climate or soil conditions are not suitable. For instance, Spitzenbergs have been planted quite extensively in some districts. It is now being ascertained that in a great many districts that Spitzenberg trees are susceptible to blight. This is true more particularly in warm sections, where the blight has already done an immense damage, not only to pear trees but to Spitzenbergs. Figuring on reasonable

prices for apples during the next five years or so, many are finding that in some sections they can make more money by growing alfalfa, engaging in the dairy business, raising hogs or engaging in some other line of farming than they can out of the apple business. Therefore it looks very much to the editor as if the decreasing acreage during the next two or three years will be rapid and that the maximum production will probably be reached in 1918.

Varieties for the Northwest.—The number of varieties of apples in which the Northwest has shown extreme superiority in all respects are comparatively few, therefore the Northwest will do well to figure out for the different locations which varieties they will be justified in retaining, and what they ought to either dig up or graft over. Among the principal varieties that look good at the present time, in accordance with their time of ripening, are: Gravenstein, King, Jonathan, Spitzenberg, Delicious, Winter Banana, Rome Beauty, Ortley, Winesap and Newtowns. In the minds of some there is some question about the future of the Jonathan, for the reason that this variety does very well in many other states in the Union. In fact it is grown in many states, whereas the other varieties named are superior in the Northwest and can be produced in only a few states in localities which are limited.

Apple Packing House.—Every grower who has not already a good packing house on his place should erect a shed or cover so he can keep a good quantity picked ahead, under cover, so as to keep the packers going steadily during rainy days that frequently occur during the harvesting season. A shed answering this purpose can be built at small cost. Frequently many growers who have sheds now need additional room. One of the best conveniences for this purpose and one of the cheapest is a good sized tent about 30x40 feet, which affords a splendid place in which to put the grading machine and packers, shutting off the wind and keeping out the cold and rain. These tents can be ordered from a tent manufacturer, any size you want. The price of a 30x40-foot tent, according to the ply, would cost somewhere from \$60 to \$80. The cost of lumber for the framework would probably not exceed \$10 or \$15, so for from \$75 to 100 a man can fix up a tent that will accommodate a grading machine and packers and take care of the entire day's packing after being packed, which is usually hauled away regularly each day.

The editor desires to call attention editorially to the article beginning in this issue on pruning, which will be continued during the next five or six issues of "Better Fruit." The first section appearing in this issue is devoted to "Plant Physiology as Related to Pruning," by W. M. Atwood, Depart-

ment of Botany and Plant Pathology, Experiment Station, Corvallis. The next four sections are by experts connected with the same institution, the second being a "Study of Fruit Buds," by an eminent authority, E. J. Krans. The third section is "Pruning of Young Trees," by Professor C. I. Lewis, who has a reputation as a horticulturist, scientifically and theoretically, according to Western methods, unsurpassed by any horticulturist in the United States. The fourth section is devoted to "Pruning of the Bearing Pear Tree," by Professor V. R. Gardner, who has given some of the most valuable instruction to Northwestern growers on this subject of any man who has written or talked about it. The fifth section, "Pruning the Bearing Prune Tree," is also by Professor V. R. Gardner. Each one of these articles is written in the briefest language possible and each illustrated in a very thorough and scientific way with splendid illustrations.

Cull Apples.—Perhaps no better advice can be given the grower in reference to cull apples, which contain scab, codling moth, San Jose scale or any pest which can be communicated, than to advise him to put them in sacks as fast as they are gathered up, tying up the end of the sacks and haul them to the vinegar factory promptly. By leaving them around such diseases or insects as they may contain remain to infest the crop next year. This is particularly true in reference to codling moth, which will crawl out and go in the cracks of the packing house, next year producing a large crop of worms to bore the crop full of holes. The editor has done this for several years. This in connection with spraying has reduced the crop of wormy and stung apples regularly each year. Proper spraying and getting rid of the cull apples promptly each year will sooner or later result in the crop being almost entirely free from many pests. During the thinning season the thinners only reported five worms and stings in the editor's orchard in a crop of about 5,000 boxes.

The Apple Crop of the Northwest.—Several years ago, at the National Apple Show at Spokane, some railroad officials and newspaper men in compiling statistics of the acreage made a prophecy as to the quantity of apples the Northwest would produce. It was stated at that time, as nearly as the editor remembers, five years ago, that in 1915 the apple crop of the Northwest would be 50,000 cars and in 1920 would be 150,000 cars. The editor at that time stated he did not believe the Northwest crop in 1915 would exceed 15,000 cars. 1915 is here and according to the consensus of conservative estimates it is the general opinion now that the crop will be somewhere in the neighborhood of 12,000 cars, maybe less, instead of 50,000 cars, as stated by the various railroad officials and newspaper men.

Grading Machines.—The experience of of the Northwest in marketing is such that we are compelled to admit that we have to put up a high-class product; varieties of apples that have quality, that are not grown extensively in the East, making our pack uniform and our grade perfect. There is no one factor that is so much help in securing uniformity of size in grading and packing as the grading and sizing machine. Several makes are on the market which have been tried out and have proved their efficiency and economy. It is the opinion of many growers that by using a good grader 5 to 10 cents per box can be saved in the packing house. When an orchard produces 2,000 boxes or over, according to the size of the crop, a grading machine can be paid for in one or two years, at the same time doing the work more efficiently and quicker. The apples will bring better prices.

Economy in Harvesting.—The apple growers last year either made no money or lost money, consequently they have to strive this year, as the situation looks fair for good prices, to make enough money to produce a fair average income for last year and this year. While the situation looks reasonably good for fair prices it will be necessary for the grower to endeavor to save as much as possible in every way. Already attention has been called to the grading machine as a saver, to picking receptacles and ladders. Growers should aim to secure careful pickers and good packers, paying them fair prices for the work, endeavoring to be economical as possible in every way. So much money saved is just as good as so much money made.

Boutell Apple Paring Machinery

Dayton Hardware & Machinery Co.
PORTLAND, OREGON
Write for Catalogue

Western Commercial Fruit Evaporator Co.

1005 Chamber of Commerce Bldg.

Refer to our ads in the March, April, May and June numbers of "Better Fruit"

PORTLAND WHOLESALE NURSERY COMPANY

Rooms 6 & 7, 122½ Grand Ave., Portland, Oregon

Wholesalers of Nursery Stock and Nursery Supplies
A very complete line of
Fruit and Ornamental Trees, Shrubs, Vines, Etc.
SPECIALTIES
Clean Coast Grown Seedlings
Oregon Champion Gooseberries and
Write Now Perfection Currants Write Now

WANTED!

To hear direct from owner of good farm or unimproved land for sale.

C. C. BUCKINGHAM
Houston, Texas

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

Special Prices

— ON —

Mitchell Ladders

On account of overstock we are making a reduction in prices of our Mitchell Ladders. If you will need a ladder now or next year

Buy Now and Save Money

Apply at the nearest Mitchell dealer, or mail in this coupon:



Portland, Oregon

Send me special prices on your Mitchell Ladders.

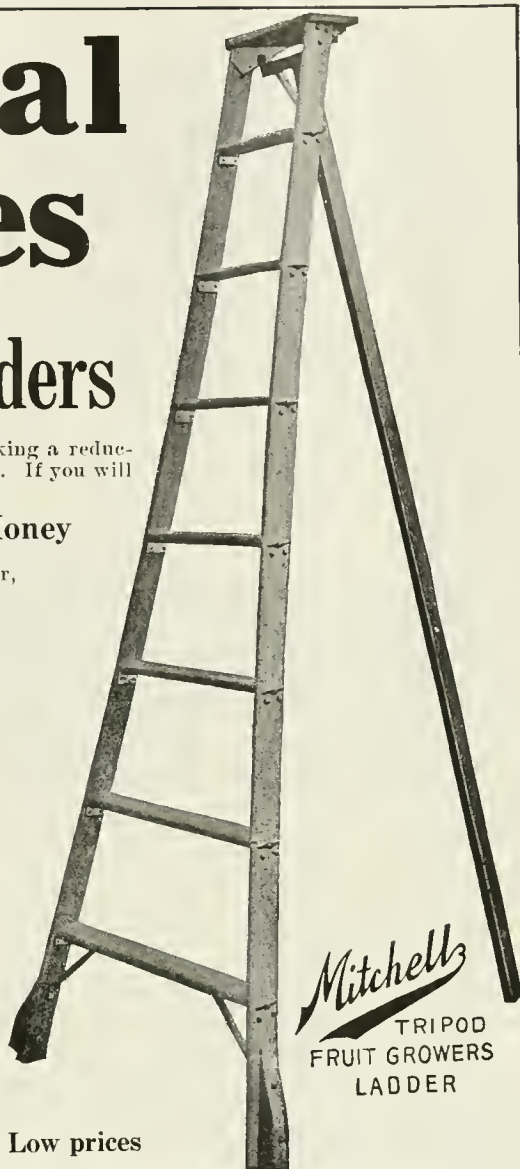
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.....

Cider Mills

Four sizes of the best type. Low prices



Mitchell
TRIPOD
FRUIT GROWERS
LADDER

Picking Ladders.—It is false economy on the part of the grower to endeavor to get along with an insufficient supply of good ladders. Too frequently we see apple growers with old ladders that are rickety. Every once in a while a picker falls off the ladder with a bucket of apples, bruising half a box. Other growers, to save buying ladders allow the pickers to climb up in the trees, frequently shaking off enough apples to pay several times the cost of a good ladder. In addition to this, when a grower allows a picker to climb in a tree it is barked and more or less permanently injured.

Apple Boxes.—Every grower should haul out boxes according to his crop estimates, at the earliest possible moment, making them up ready for use when the harvesting season begins. Another important reason for doing this is that frequently the boxes that come from the mill are more or less wet and will not dry out knocked down, but if made up and piled in the packing house they will dry out. Apples will keep better when packed in thoroughly dry boxes than wet boxes.

Ridpath's History of the World At A Bargain



Weights 50 lbs.—2,000 Pages—4,000 Pictures
We will name our price only in direct letters to those sending us the Coupon below. Tear off the Coupon, write name and address plainly, and mail to us now before you forget it. Dr. Ridpath is dead, his work is done, but his widow derives her support from his history, and to print our price broadcast for the sake of quickly selling these few sets would cause great injury to future sales.

INSPECTION COUPON

WESTERN NEWSPAPER ASSOCIATION 9-15
Better Fruit Bureau, Hood River, Oregon
Please mail your 46-page free sample booklet of Ridpath's History of the World, containing photographs of Napoleon, Queen Elizabeth, Socrates, Caesar and Shakespeare, and write me full particulars of your special offer to "Better Fruit" readers.

NAME
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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

AWARDED GOLD MEDALS San Francisco 1915

ZEROLENE OILS & GREASES RED CROWN GASOLINE

The Exposition jury found Zerolene first in lubricating efficiency; Red Crown, first in carbureting qualities, in purity and uniformity. A victory for Standard products made from California crudes, in competition with other gasolines and automobile oils!

Standard Oil Company
(California)

OUTRIGHT SALES QUICK RETURNS MINIMUM COST
GROWERS AND SHIPPERS

Do You Want **CASH** for Your Fruit?

Why become involved in long drawn out pools—delayed settlements—unsatisfactory returns—and unnecessary disappointments when you can obtain **EXPERT MARKETING SERVICE** at a **MINIMUM COST** with **ALL RED TAPE ELIMINATED**.

I SPECIALIZE ON F.O.B. CASH SALES

Write me at once if interested, specifying the number of cars and varieties of fruit you will have to market and advise very lowest prices will take loaded for shipment.

H. E. SMITH

Independent Marketing Agent Northwestern Fruits

Office Address
During August, September and October
Walla Walla, Wash.

Chicago, Ill.

Formerly Sales Manager
North Pacific Fruit Distributors
Payette Fruit Packing Co.

EXPERIENCED

COMPETENT

RELIABLE

Picking Receptacles.—Every grower should be careful about picking his apples, endeavoring to prevent all unnecessary bruising. There are several picking receptacles on the market in the way of picking buckets with canvas bottoms, and some canvas bags, which will bruise the apples less than ordinary buckets. These patent devices are also easier to empty and the emptying is done not only more rapidly but with less bruising.

Apple Packing.—First, secure able packers who put up an honest pack. Beware of the apple packer who packs too many boxes in one day. While some packers may exceed 100 boxes per day, under favorable conditions with a large run of sizes, a good packer taking all grades, sizes and conditions as they occur throughout the harvesting season will very seldom average much over 100 boxes, while there are many who cannot and will not average this quantity.

Apple Harvesting.—Apple harvesting will commence in various sections the latter part of September or the early part of October, therefore a few suggestions in the way of preparation may be of some value to the fruitgrowers who are inclined to be, frankly, just a little lax in making thorough preparation in advance of the harvesting season.

Apple Picking.—Don't expect your apple pickers to pick more than a reasonable number of boxes a day. Whenever a picker picks too many boxes generally he will knock off, by working rapidly and through being careless, a large number of fruit spurs, which will make the crop short next year.

Attention is again called to the article by A. Millard, Jr., which contains a wonderful fund of information, the result of a long period of thorough research work. This article began in the July issue and will be completed by December.

Experienced Orchardist and Farmer

with several years' experience in both Hood River and Wenatchee, wishes situation as manager of an orchard or diversified farm. Best of references. Address "O," care "Better Fruit."

Do you need the services of an orchard superintendent? one who is familiar with and competent in every phase of orchard management. Am an elderly man; experienced in handling of help. Care of and marketing of fruit a specialty. Address F. W., care "Better Fruit."

Orchard Superintendent

Unusual chance to get position as superintendent on 100-acre orchard, mostly in bearing. Must be able to take full charge and be experienced pruner especially. Good buildings. Married man preferred, with some cash. Will be expected to secure small amount of stock in the company or interest in tract. Address "Supt.," care "Better Fruit."

WANTED

Position as Superintendent or Manager of large commercial fruit orchard by Agricultural College graduate with years of experience. Best of references. Married, one child. Address R. W. M., Wengel Apts., Madison, Wis.

J. & H. Goodwin, Ltd. APPLE IMPORTERS

Commercial Sale Room, Deansgate,
Manchester, England.
Floral Street, Covent Garden Market,
London, England.
Fruit Exchange, Victoria Street
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97 Warren Street, New York, N. Y.
60 State Street, Boston, Mass.

Consignments and Correspondence Solicited

Experts Talk on Vital Questions

Mr. Parlin of the Curtis Publishing Company, Philadelphia, and Mr. Boyce of the San Francisco office of that company, who are visiting the various sections of the Northwest, gave very interesting and instructive talks on "Advertising," which included much general information of a very interesting nature on many varied subjects, directly and indirectly connected with advertising.

The Cost of Living.—The statistics collected by the Curtis Publishing Company on the cost of living are extremely interesting. This report was compiled by ascertaining the expenses of 2,567 working families. The cost of living average as follows: Food, 40 per cent; rent or upkeep of home, 14 per cent; clothing, 13 per cent; fuel and light, 5 per cent; all other expenses, 21 per cent; surplus, 7 per cent. Expressed in other words, the average income of these working families was \$827, which was divided as follows: Food, \$327; rent and upkeep, \$119; clothing \$108; fuel and light, \$40; all other expenses, \$175; surplus, \$58.

The Percentage of Different Foods Consumed by the Average Family.—Mr. Parlin states that the average family spends in meat and poultry 33 per cent; dairy products, 22 per cent; vegetables, 10 per cent; flour and bread, 9 per cent; other foods, 21 per cent; fruit, 5 per cent. In other words, according to Mr. Parlin the average family of the United States spends annually \$16.35 of his income in fruits. This indicates very forcefully the necessity of the fruitgrowers doing some educational work with advertising, educating the public as to the value of fruit as a food. It is a well-known fact that the Americans are large meat eaters and eat a great deal less fruit than many other nations. Fruits are not only nutritious but wholesome, and in addition to this they assist in digestion and also assist in keeping the system in perfect order. If the public was sufficiently acquainted with the value of fruit along these lines the consumption would be wonderfully increased. It requires the right kind of educational campaign to bring about such a condition. Such a campaign should be taken up by the fruit-growers at the earliest possible opportunity.

From the Producer to the Consumer.—Mr. Parlin gave some interesting information showing the necessary changes that products must go through in order to reach the consumer. In speaking of fruit growing he named first the producer or grower, then the exchange, association or shipping concern, then the wholesale fruit jobbers in the various cities, the retailers, and eventually the consumer. Many growers have frequently expressed the idea and opinion that the fruitgrower can sell direct to the retailer. It must be admitted that fruit could be handled in this way, but on the other hand it is



Fall Sowing

OUR TESTED GRADES OF VETCH-CLOVER-GRASS SEED AND COVER CROPS

have had much to do with the Agricultural Development of the Pacific Northwest. *We furnish all Seed tested for Purity and Germination.* They are Grown, Cleaned and Packed under our supervision and tested by experts. Sold by dealers in Lilly trade-marked sacks. *Send for price list.*

Lilly's Tested Seeds



SUGAR PRICES CUT!

Buy at wholesale from Jones Cash Store

Again this old reliable mail order house comes to the front with a smash at high sugar prices! We handle more sugar than any other concern in the Northwest. Supply sugar for your fruit and preserving needs, at wholesale. If you have never ordered by mail from us, take this chance and get acquainted.

Best Fruit or Berry Sugar \$6.15
100-Pound Sack Now for ...



Ball-Mason Fruit Jars Reduced

Very best quality.
PINTS, dozen50c
Gross \$5.50
QUARTS, dozen55c
Gross \$6.50
½ GALLONS, doz. .80c
Gross \$9.00
FRUIT JAR CAPS,
dozen.....20c
Extra Heavy Rubbers,
dozen6c

Other Timely Grocery Bargains

Harvest-time groceries and provisions of all kinds at reduced prices. Send for special grocery catalog. For instance—

Canned Tomatoes, dozen89c
Fancy Evap. Peaches, lb. 6c
4-gal. Keg of Pickles.....68c
Economy Coffee, lb.....15c
Eastern Bacon,
pound..18c

THIS COUPON BRINGS YOU OUR BIG FREE CATALOGUE NO. 63

Hundreds of pages, filled with descriptions and pictures of mail order bargains! Fill out the coupon or send your name on a postal.

Jones Cash Store

Established 1882
Front and Oak Streets
Portland, Oregon

**Sign and Mail
to Us N-O-W!**

I want to be shown how to buy at lower prices. Kindly mail your big Catalog No. 63 FREE to me.

NAME

ADDRESS



Yuba Ball Tread Tractor turning close to the trees in Cutter Bros.' Orchard in Brighton, Sacramento County, California

GETTING CLOSE

Cultivated orchards pay. The closer you succeed in bringing the cultivator to the trees, the more successful is the result.

The Yuba Ball Tread Tractors bring the cultivator close to the trees—are light enough not to pack the ground, and are compact enough not to injure the fruit-burdened branches.

THE ONE-MAN OUTFIT

If the cost of cultivating your orchard was reduced 50 per cent, your income would be increased by whatever amount you saved. Suppose your cultivating equipment was a one-man outfit, instead of two, would that help you to decrease your monthly expenditures? Yuba Ball Tread Tractor owners are economizing in this way. Are you?

The Yuba Construction Company

433 CALIFORNIA STREET, SAN FRANCISCO

THE YUBA BALL TREAD TRACTOR

THE YUBA CONSTRUCTION CO., Dept. C
433 California St., San Francisco

Gentlemen:

Please send me a copy of your booklet, "The Ball Tread Tractor."

Name P. O. Box

Town State

My orchard consists of acres. The principal product is

known by those who have been in the business extensively that only a small quantity could be moved in this way. Under favorable circumstances and conditions, coupled with good ability for handling fruit, undoubtedly some fruitgrowers could market their fruit to advantage direct to the consumer, particularly where the quantity is small, but such a process would never take care of 20,000 cars in the Northwest in one season, or any great part thereof. One fruitgrower suggested to the editor that the Northwest could market its fruit by parcel post or ex-

press. To determine the value of such a suggestion just imagine what would have to be the size of the postoffice and the number of employees required at the shipping point like Wenatchee, Yakima, Hood River or some of the other big shipping stations, which in the height of the season would ship out all the way from ten to one hundred cars a day, or from 6,000 to 60,000 packages, each one weighing 50 pounds.

The Quantity of Business Done by the Different Kinds of Jobbers Throughout the United States.—Mr. Parlin

divided the jobber in four classifications, the national jobber, doing business all over the United States; the sectional jobber, doing business over some one section of the United States, like the South, West or East, for instance; the semi-local jobber, doing business not only in one state but in surrounding states, and the local jobber, doing business confined to his own immediate locality, which includes the city in which he is located and some surrounding territory. The percentage of business done by each class of jobbers is as follows: The national, 5 per

cent; the sectional, 9 27-100 per cent; the semi-local, 32 4-10 per cent; and the local 53 33-100 per cent. The volume of business done by the local jobber is so great that it is evident that the fruit-grower must give the local jobber the highest consideration in placing an immense quantity of fruit grown in the United States.

Retailer.—Mr. Parlin gave some interesting statistics in reference to the percentage of business done by the retailers on food commodities. The meat markets do 22 per cent of the business, while the corner groceries do 37 9-10 per cent of the business. This ought to indicate to the fruitgrower the value of co-operating with the retail grocers in marketing his product. Of course it is a well-known fact that an immense quantity of fruit is handled by the fruit stores, push carts and peddlers, which handle a large portion of the remaining 100 per cent.

Some interesting information was also given by Mr. Parlin in reference to the retail products consumed by the various sections of the United States which is of value to the fruitgrower, indicating to the fruitgrower where the greatest consumption of products takes place. The editor regrets he has not a complete list of the different states included in the following sections, therefore is able only to name in a general way these sections without giving definite boundaries: New York and part of New England, 21 per cent; Maine, 2 per cent; the Middle West, 25 per cent; the Dakotas, Nebraska and Kansas, 7 per cent; southern part of South, 7 per cent; Pennsylvania, 7 per cent; South Carolina and surrounding territory, 5½ per cent; Kentucky and surrounding territory, 4 per cent; Arkansas and surrounding territory, 5 per cent; Texas, 4½ per cent; California, 3 per cent; Colorado, New Mexico, Nevada, Wyoming, Idaho and Montana, 2 per cent; Arizona, one-half of 1 per cent; Oregon and Washington, 2 per cent. According to Mr. Parlin 22 per cent of the food products advertised is handled by the Saturday Evening Post, and 16 per cent is handled by the Ladies' Home Journal.

The Almeria grape crop of Spain is reported very much lighter and very much below normal and much less than last year.

FRUIT GROWERS Dehydrate Your By-Products

It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the **best Hy-Product machine ever devised**. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

For new descriptive booklet address

LUTHER MANUFACTURING CO.
San Francisco, California

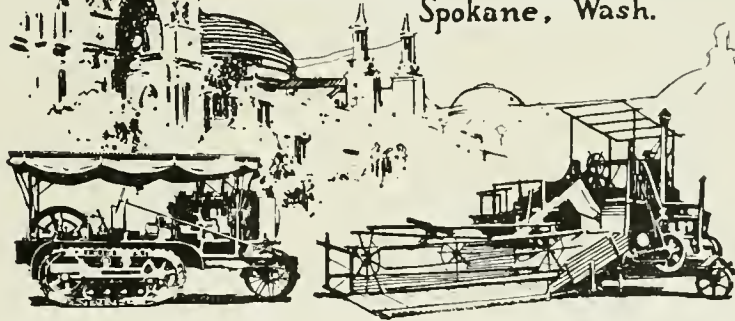
Grand Prizes

The International Jury of Awards of the Panama-Pacific International Exposition has awarded Grand Prizes for the Caterpillar Tractor and the Caterpillar Harvester. Only one Grand Prize is awarded in each class—the rating is made on the skill in invention, on the value to the world and to agriculture, and on similar points.

Send for Bulletin BE 309, which gives full information about the Caterpillar Tractor, or ask for literature on our harvester line.

CATERPILLAR
Ree U.S. Pat. Off.

The Holt Manufacturing Co. Inc.
Stockton, Calif. Peoria, Ill.
Spokane, Wash.



There Are Big Profits in the Cider Business

Let us tell you how you can earn big profits making Cider, Vinegar, Apple Butter, etc., on a "Mount Gilead" Hydraulic Cider and Grape Juice Press. A "Mount Gilead" Cider and Grape Juice Press will pay for itself in the extra juice it will extract as compared to other makes.

We manufacture Evaporators, Apple Butter Cookers, Vinegar Generators, Cider and Vinegar Filters, etc. Let us tell you about "Mount Gilead" outfits and how you can put good profits in your pocket by their use.

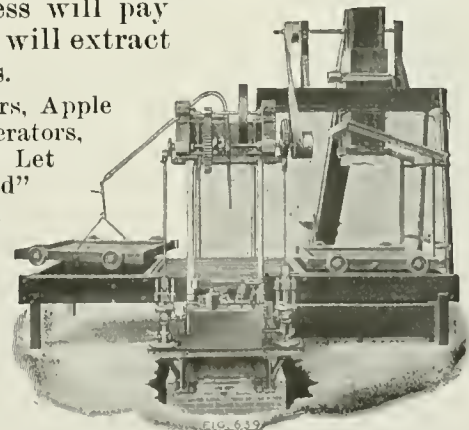
The Hydraulic Press Mfg. Co.

60 Lincoln Ave., Mt. Gilead, O.

Pacific Coast Representatives

THE BERGER & CARTER CO.

17th and Mississippi Streets
San Francisco, Cal.



Don't Get Wet



and carry around a load of water and a cold.

Tower's Fish Brand

Reflex Slicker
\$3.00

sheds every drop. Easy fitting and strong at every point. *Reflex Edges* stop every drop from running in at the front.

Protector Hat, 75 cents

Satisfaction Guaranteed

Send for catalog

A. J. TOWER CO.
BOSTON



Orchard Yarn

Progressive orchardists, those right down to the minute in methods of protecting heavy laden fruit trees, are agreed that tying branches with Orchard Yarn is the modern way of supporting orchard trees. It is not expensive, is easily done, and the time to tie is when trimming. The spurs are then tougher, less easily broken off than later, leaves are not in the way and all parts of the tree can be seen. Saving but a small percentage of trees from being broken down will pay for the expense of tying an entire orchard. One-ply Tarred Manila Yarn will run about 200 feet per pound. Two-ply will run from 90 to 100 feet per pound. Put up in 5-pound balls or on 10-pound spools. In 5-pound balls the yarn pulls from the inside and is more easily banded.

Sold by all merchants handling orchard supplies.

Manufactured by

The Portland Cordage Company
PORTLAND, OREGON

Store Your Apples in Spokane

The Natural Storage Center

Take advantage of storage in transit rate and the better market later. Write us for our dry and cold storage rate and information.

Ryan & Newton Company

SPOKANE, WASHINGTON

Contest for Boys and Girls

The Washington State Fair, which will be held in North Yakima this year September 20 to 25, is going to make a strong appeal to the interest of the boys and girls of the state. An attractive list of premiums has been prepared in a special catalog covering different phases of agricultural displays and stock judging. Besides the regular list of premiums, several individual prizes are likewise offered. One of these is a scholarship at the Washington State College, offered through its president, E. A. Bryan, to the most successful student of any high school, or eighth-grade graduate in the stock-judging contest. As tuition at the state college is free, the prize will be accepted as an exemption to the extent of thirty dollars in room rentals or other fees. Another individual prize is offered by Dr. H. T. Graves, state commissioner of agriculture, for the best exhibit of vegetables submitted by any boy or girl in the state residing outside of Yakima County.

The scope of the children's industrial contests at the State Fair is wide and covers Home Economics, Agriculture, Manual Training, Nature Study, Educational, Floriculture, Horticulture and Livestock. So comprehensive has this department been made that the special premium list was made necessary. Rodney Ackley, a children's organizer of state-wide reputation, is the superintending in charge, and a systematic effort is being directed toward making the department one of the interesting and educational features of the fair. The contests are open to the children of the entire state, and the premium list is scarcely equaled by any state fair in the West this year.

Seattle fruit jobbers during the month of August reported a strong demand for all kinds of fruits.

YOU CAN EARN \$50.00 PER DAY



with the Gearless Improved Standard Well Drilling Machine. Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours.

Another record where 70 feet was drilled on 2 1/2 gal. distillate at 9c per gal. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W.B. REIERSON MACHINERY CO., Manfrs., Portland, Ore.

To Growers and Shippers of High Grade Apples in Boxes
We Recommend Our

Edgemont Lid Press

AS BEING

Strong, Durable, Convenient and Moderate in Price

That a Lid Press with nail stripper and cleat box, brackets to hold lids where you want them, cleat hooks to hold cleats while nailing and a perfect treadle ratchet is appreciated by the growers is shown by the sale of hundreds of them to growers not only of the Northwest but of nearly every fruit district of the United States.

Send for circulars and prices to

H. PLATT & SONS, Como, Montana

YAKIMA HARDWARE CO., North Yakima, Washington
PLOUGH HARDWARE CO., Wenatchee, Washington
BERGER & CARTER CO., 504 Mission Street, San Francisco
B. G. PRATT CO., 50 Church Street, New York City
INLAND SEED CO., 913 First Avenue, Spokane, Washington
PIONEER PACKING HOUSE, Hood River, Oregon



You can buy an
Edgemont Lid Press from



PORTLAND ACADEMY

Work: Preparation for college career or business life. A department with Grammar Grades. Special preparation for engineering courses. Evidence of the success of Portland Academy lies in the fact that over half our graduates have successful college careers.

Athletics: Unexcelled athletic facilities. Football, baseball, basketball and track teams. An annual tennis tournament. Excellent gymnastic equipment.

Boarding: Portland Academy is a day and boarding-school. Fine boarding-halls for both boys and girls. Careful supervision.

The 27th school year begins September 13, next.

JAMES F. EWING
Principal
Portland Academy
Montgomery St.
Portland, Ore.



MISS HARKER'S SCHOOL FOR GIRLS

PALO ALTO

ACCREDITED TO COLLEGES!
GRAMMAR AND PRIMARY GRADES
FOURTEENTH YEAR
Catalogue upon application
Address

MISS HARKER, Palo Alto, California

Mount Tamalpais Military Academy

SAN RAFAEL, CALIFORNIA

The most thoroughly organized and completely equipped Military School west of the Rocky Mountains; Cavalry, Infantry, Mounted Artillery. Sixteen miles North of San Francisco; U. S. army officer detailed by War Department; accredited by the University of California, Stanford and other Colleges. Twenty-sixth year begins August 24th, 1915.

Address Rev. Arthur Crosby, A.M., D.D.

ST. HELEN'S HALL

PORTLAND, OREGON

Diocesan Boarding and Day School for Girls under the care of the Sisters of St. John Baptist (Episcopal Church) Forty-Seventh Year begins September 15th College Preparatory and General Courses, Music, Art, Elocution, Gymnasium, Swimming, etc. Montessori Kindergarten for little boys and girls under seven. For Catalogue, address, THE SISTER SUPERIOR.

FRONTIER DAYS



Emigrant Trains
Stage Coaches
Indians
Trail Blazers
Cow Boys
Cow Girls
Racing, Roping
Broncho Busting

Showing Early Life
in the Far West

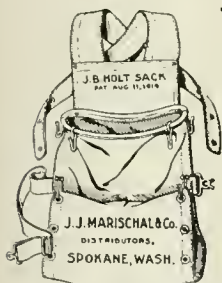
WALLA WALLA
WASHINGTON
SEPT. 16-17-18, 1915

Monster Street Parade. The World's Most Celebrated Riders and Ropers will be Present to Contest for the Championship. A list of Prizes Will Be Sent Upon Application.

A Reproduction
of Stirring Events
of Pioneer Times



A WESTERN SHOW THAT'S THE REAL THING
EXCURSION FARES



Holt Picking Sack

NO MORE BRUISED APPLES

A good picker can pick enough more, and to better advantage, with this bag to pay for its cost in two days. Money back if not satisfactory.

ORDER NOW. PRICE, prepaid, \$1.75
Agents Wanted
J. J. MARISCHAL & CO.
Spokane, Washington

Things We Are Agents For

Knox Hats

Alfred Benjamin & Co.'s Clothing

Dr. Jaeger Underwear

Dr. Deimel Linen Mesh Underwear

Dent's and Fownes' Gloves

Buffum & Pendleton

311 Morrison Street

PORTLAND, OREGON

What are your dairy problems?

To get started profitably in dairying as a side-line, the fruit grower needs helpful advice and suggestions.

Our service department will delight in doing this very thing, without any charge or obligation.

We are sole Oregon distributors for "Simplex" Separators, B-L-K Milkers, Papec Ensilage Cutters, Simplex Silos and all kinds of dairy, butter-making and cheese-making supplies.

Your name on a postal will bring Free Catalogs

Monroe & Crisell

126 Front St.

Portland, Oregon



Don't Simply Buy a Mattress

Insist on getting a

HEYWOOD MATTRESS

It is guaranteed to give you perfect satisfaction.

Each mattress comes separately wrapped in its original package—a sanitary advantage which appeals to the discriminating.

At all better dealers

\$12.00, \$15.00 and \$18.00

If your dealer cannot supply, write direct to

HEYWOOD BROTHERS AND WAKEFIELD COMPANY
Portland and Seattle



\$72.50 Chicago—round trip

\$71.20 St. Louis—round trip

\$60.00 St. Paul, Omaha, Kansas City—round trip

\$110.70 New York—round trip

and many other places in like proportion—\$67.70 to Des Moines; \$55.00 Denver; \$83.50 Detroit Daily

Low Fares East Expire
September 30

Routings via California

Trains the Traveling Public Approve for Quality Service:

"The North Bank Limited"

Daily at 7:25 P. M.

"Inland Empire Express"

Daily at 9:55 A. M.

For Spokane, St. Paul, Chicago

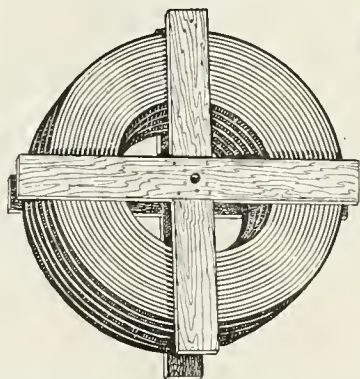
SS. "Great Northern" and "Northern Pacific" Reservations for California and Railroad Tickets to any point.

R. H. CROZIER, A. G. P. A.
PORTLAND, OREGON

PORTLAND TICKET OFFICE
5th and Stark Streets



Spend a Nickle and Save a Dime



No. 3 Peerless Duplex Strapping in coils of 6,500 feet each—\$14.63 per coil with liberal discount.

No. 3 Duplex Strapping is made of high grade Cold Rolled Steel of considerable tensile strength and pliability. The turned edge protects the packer's hands; the knurled center prevents the nail from slipping while being driven.

**Discounts and Information from
Pacific Coast Representatives**

A. C. RULOFSON CO.

No. 359 Monadnock Building, San Francisco, California

TWISTED WIRE AND STEEL CO.
515-521 Greenwich Street, New York, N. Y.

Use Peerless Duplex Strapping ON YOUR Shipping Boxes

- (1) You will prevent pilfering.
- (2) You will prevent damage in handling.

"PERFECT" Cement Coated Nails

OUR PRODUCTS ARE OF SUPERIOR QUALITY
AND GUARANTEED TO GIVE SATISFACTION.

PRICE and QUALITY always right.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.

A. C. RULOFSON CO.

"The Cement Coated Nail People"

Monadnock Building, SAN FRANCISCO, CALIFORNIA
PACIFIC COAST SALES MANAGERS

**FLIES WON'T BITE
COWS WON'T KICK
IF
"WOOD-LARK" FLY REPELLENT
(TRADE MARK)
IS USED. EASILY APPLIED
SAVES TIME · TEMPER · MILK · MONEY.**

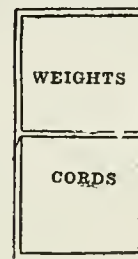
If your dealer hasn't it, send us his name, with seventy-five cents, and we will send you at once, all charges prepaid, a half-gallon package.

WOODARD, CLARKE & CO.

Wood-Lark Building

Portland, Oregon

BUY DIRECT FROM FACTORY— MONEY SAVED ON BUILDING



WINDOWS Sash and Glass Frames and Finish

24x28-13-2 light window
\$1.10

FRONT DOORS
SASH PANEL
DOOR FRAMES
DOOR FINISH
DOOR HARDWARE
Door 2:6x6:6
5 cross panels **\$1.10**

**DIAMOND
HOUSE PAINT**
Strictly Pure, Our Own Make
Per Gallon, **\$1.75**

LEADS, OILS, VARNISH
CARBOLINEUM
CREOSOTE



PORTLAND DOOR AND WINDOW CO.
230 Front St., PORTLAND, ORE.

SEE CALIFORNIA AND HER TWO GREAT EXPOSITIONS NOW

California is this year holding two great universal Expositions, one at San Francisco and the other at San Diego, in celebration of the completion of the Panama Canal and the joining of the Atlantic and Pacific Oceans. These two Expositions represent an expenditure exceeding one hundred million dollars. To supply the demand for reliable and authentic information on these Expositions and California, we have published two beautiful books; one on San Francisco, the Exposition and Northern California; the other on Los Angeles, San Diego, the Exposition and Southern California; also a lithographed view of San Francisco in colors (size 30x45 inches), a picture of the rebuilt city, including the Exposition. Each book is 6x9 inches, contains nearly 200 pages and many beautiful illustrations.

These two books and large bird's-eye view give a comprehensive, honest history and description of the state, her principal cities, resources and her two great Expositions. Sent prepaid for 35 cents each or all three for a one dollar bill, money order, draft or check. Order now, addressing

North American Press Association,
Publishers,
1420 Hearst Building, San Francisco.



LEWIS AUDIBLE SPEED INDICATOR

The "Missing Link" that attaches to any Cream Separator for any speed. Rings a warning bell while under-speeding. Clicks loudly at the right speed and at over-speed is silent. Increases yield of butterfat and insures uniform tests at creamery. Descriptive circulars on application. Postpaid \$3.25. Liberal terms to agents.
Columbia Dairy Supply Co.
Portland, Oregon

The apple crop of Wenatchee is reported approximately around 80 per cent of last year. Last year, if we remember correctly, Wenatchee shipped about 5,600 cars. The crop this year is estimated variously from 4,000 to 5,000 carloads. It is also stated that one-quarter of the Wenatchee apple crop has already been contracted for by cash buyers. The Wenatchee apple crop is being marketed through various organizations, among which may be mentioned the Northwestern Fruit Exchange, the North Pacific Fruit Distributors, Wenatchee Fruit Growers' Association, E. Wagner & Sons, who have contracted a large block for Australian shipment; Wagner & Sons of Chicago, who are extensive handlers, and a number of other large fruit dealers who are extensive operators in the Wenatchee district. All told there are somewhere probably in the neighborhood of fifteen to twenty handling concerns operating in this district.



The Southern Pacific Building at the Panama Pacific International Exposition. This is 200 feet square, of Renaissance architecture. It is open daily and fruit growers are invited to visit the rest rooms, to attend the illustrated lectures and organ recitals in its theatre, and also to stroll through the Glade, where some of the noted scenes on the Southern Pacific lines are reproduced in pleasing effect.

FOR FALL SOWING

"Diamond Quality"

TESTED

**CLOVERS—ALFALFA
VETCHES—GRAINS
GRASSES and FIELD
SEEDS**

**MIXTURES for DRY LAND—
WET LAND—BURNS—Permanent
HAY CROPS and PASTURES—
COVER CROPS for ORCHARDS**

WRITE FOR SAMPLES

and Prices or Send in Your
Order—You will Receive
Prompt Service and Full Value

ASK FOR CATALOG No. 200

**PORTLAND
SEED CO.**



Portland, Ore.

Agents "CLIPPER" Fanning Mills

Pacific Coast Agents
**United States Steel
Products Co.**

San Francisco
Los Angeles
Portland
Seattle



J.C. Pearson Co., Inc.
Sole Manufacturers

Old South Bldg.
Boston,
Mass.

PEARSON

ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.

ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.

ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

NAILS

YAKIMA FRUIT SELLERS

North Yakima, Washington

A Central Selling Agency for Yakima

EXCLUSIVE DISTRIBUTORS FOR

**Yakima County Horticultural Union
Yakima Fruit Growers' Exchange
Richey & Gilbert Company**

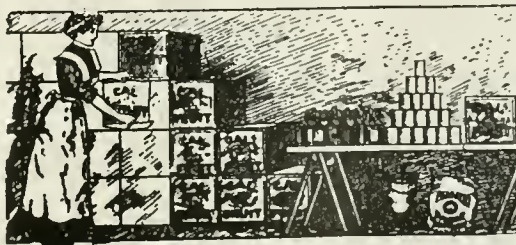
Our organizations handled 2,500 carloads of Yakima Fruit last season. Hundreds of growers have joined our movement and we already have under contract a much larger proportion of Yakima tonnage than ever before. Additional tonnage is coming to us daily. We have a large proportion of the fruit in the early districts—therefore we can load the early assorted cars—money-makers for the trade and the growers.

WRITE OR WIRE US IN SEASON

H. M. GILBERT, General Manager

FRED EBERLE, Asst. Manager

Paste for Labeling—"Palo Alto" Paste Powder



added to cold water, instantly makes a beautiful, smooth, white paste. Ready for immediate use at a cost of 10 cents a gallon. No labor. No muss. No spoiled paste.

PASTE SPECIALISTS

Robinson Chemical Works

349-351 Eighth Street

San Francisco, California

CUT THE COST OF PACKING

PRICE
PREPAID
\$8.00



WITH THE

PRACTICAL BOX MARKER

Puts on the five stamps at one operation.
Write for information.

PRACTICAL BOX MARKER CO., Otis Orchards, Wn.

HOOD RIVER APPLE VINEGAR CO.

HOOD RIVER

**YELLOW NEWTON VINEGAR
AND SWEET CIDER
EVAPORATED APPLES**

Made from Choice Hood River Apples

If your jobber cannot supply you
send your order to

Hood River Apple Vinegar Co.
HOOD RIVER, OREGON

Every Farmer

is interested in the manifold uses of
cement-concrete on the farm.

Practical Cement Work

By W. B. HENRY

is a cloth bound book of 112 pages, giving
valuable information on the mixing and
placing concrete in the various forms of
building.

Post paid, 50 cents.

The Concrete Age

Equitable Building ATLANTA, GEORGIA

Oregon Nursery Company

ORENCO, OREGON

Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens,
Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN
FRANQUETTE walnut, recognized as the best walnut. Our large
complete stock consists of varieties suitable for every kind of climate.
Write us about your wants before buying.

Pears—Cherries—Prunes

in leading varieties. This stock is especially fine this year; can't be beat; is free from disease and in fact, you can't wish for anything better. Also berries, roses, ornamentals, etc. Catalog on request.

CHRISTOPHER NURSERIES, JOHN A. STEWART & SON, Props.
Christopher, Wash.

HOOD RIVER VALLEY NURSERY COMPANY

Phone 5634

Route No. 3, Box 227

HOOD RIVER, OREGON

Plantation four miles southwest of station, Belmont Road

We will be pleased to show you trees, apple trees that have a heritage, a quality that should be considered by everyone who plants a tree. Our trees are grown in clean hillside virgin red soil with clay subsoil, producing the most vigorous root system. Our buds are selected from the best bearing healthy Hood River trees that make the Hood River apple famous throughout the world. Our trees will give you satisfactory results in vigor, fruit and quality. Ask for catalog. We guarantee our products. Apples, pears, peaches, apricots, almonds and walnuts. A complete line of the best varieties of all kinds of fruits.

H. S. BUTTERFIELD, President

W. J. ENSCHEDE, Manager

LESLIE BUTLER, President
TRUMAN BUTLER, Vice President
C. H. VAUGHAN, Cashier

Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital \$100,000.00

4% Interest Paid in our Savings Department

WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

Apple as a Farm Product, Etc.

Continued from page 10

tion. The banana trade is even more recent and the grapefruit most recent of all. Florida grapefruit alone increased from 117,336 boxes in 1900 to 1,611,537 boxes in 1910, about 900 per cent. (See Table VI.) Our population is increasing rapidly, and more and more fruit per capita seems to be eaten. This gives room for increase in all agricultural production, but the fruit production has been generally over-emphasized, and a man will either eat an orange, a grapefruit or an apple for breakfast; he won't eat them all, or if he were able to perform this feat the growers of each respective fruit would all clamor to have him eat three of their particular kind.

The apple has certain advantages; some of these have already been mentioned. The apple has always been and is the leading fruit of this country, and this is worth something; but the rapid public appreciation of the citrus fruits in the past generation has shown this advantage is not necessarily permanent. The apple can be consumed in more conditions than can any other fruit. The apple has more to fall back on in the way of by-products than any other of our orchard fruits, in spite of the "essential oils" of the citrus industry. Probably more than any other advantage found in the apple will be the possibility of lower cost of production of this fruit, compared to others, and its greater ability, compared to some, to find outlet in the lower levels of ultimate consumers.

Under chapter three we have discussed the markets of this country, applying the question to farm products generally, and as regards the domestic markets, apples fit in with this discussion with only slight qualifications. Apples are so universally produced for home use by farmers that the farms and small villages, and even many outlying towns are practically marked off the map of demand for the fruit that is not produced in that immediate locality. This differs apple from orange distribution, for instance. Further, Eastern apple states can hardly expect to market apples in other Eastern apple states, except in the larger cities, and even there they are at a strong disadvantage. The whole market question is thus to some degree localized on a large scale. Western apples are an exception to this, and have proven their ability to sell on their appearance beside less expensive and often quite as good quality locally-produced fruit. The writer has observed Pacific Coast apples attracting attention on fruit stands in Rochester, New York, the center of perhaps the greatest apple region in the world.

(To be continued)

The percentage of apples exported from the United States is variously estimated at from 3 to 5 per cent, while the percentage of Northwestern apples exported is estimated at approximately around 10 per cent, varying in different years,—usually less.

Controlling the Apple-Borer

"Worming" and painting the trunks of the trees are recommended to owners of apple orchards as efficient methods of dealing with the roundheaded apple-tree borer, in a new Farmers' Bulletin, No. 675, of the United States Department of Agriculture. A heavy application of some paint that will not injure the trees but will remain in an unbroken coat on the bark for two or three months, is effective in preventing the female from laying her eggs in the tree, and greatly reduces the amount of worming, or the removal of the insects with a knife and wire, that must be done.

The roundheaded apple-tree borer, the most destructive of a number of similar pests, lays its eggs in or under the bark and wood to such an extent that the tree is seriously weakened or killed. The pest is found over the whole of the eastern portion of the United States and as far west as Nebraska, Kansas and New Mexico. In addition to fruit trees, it feeds on service, wild crab and mountain ash trees, which makes it advisable for orchardists to remove these varieties for a distance of at least one hundred yards from their orchards.

The female lays her eggs, one at a time, in an incision she has made in the bark, usually just above the surface of the ground. About 15 or 20 days later the eggs hatch and the larvae appear. When full grown these are nearly an inch and a half in length. They first attack the inner bark, eating out broad, more or less circular galleries and thrusting out through small holes and the insect pulled out. If made in the bark castings which form little heaps of reddish wood fragments around the base of the tree. During the winter the borers are quiescent, but early in the following spring they attack the solid wood, while some of them work their way up the trunk. These last spend one more winter in the tree and then having passed through the pupae stage, dig their way out and emerge as adult beetles. Three years are required for the insect to complete its development from egg to adult.

Ordinarily, the beetle lives about 40 or 50 days. It is about three-fourths of an inch in length, light brown in color above, with two broad white bands, joined in front, extending the full length of the back; the underparts and front of the head are white. The females rarely fly any considerable distance, so that if the immediate vicinity of an orchard can be kept free from them, there is little danger of a serious infestation.

The most common method of ridding an orchard of these pests is to cut away the bark sufficiently to trace the burrows made by the borer. A hooked wire is then inserted into the burrow with care, the wound in the tree caused by this process will heal readily. The castings at the base of the tree serve as an indication of the presence of the borers. Where the burrows are curved

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Oldest in the Northwest
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or obstructed in some way, so that the wire cannot be inserted, cotton batting dipped in carbon bisulphid should be inserted, and the hole then plugged with moist earth. The gas from the carbon bisulphid will penetrate all parts of the burrow and kill the borer.

In addition to worming, as this process is called, paint is often used to prevent the beetles laying their eggs. Pure white lead and raw linseed oil, mixed rather thick, will not injure the trees, and when applied to young, smooth bark, will form a protective coat during the egg-laying season. It is probable that this is a more effective method than wrapping the trees with building paper, cotton batting, cloth or other materials sometimes used for this purpose. Before painting, however, the earth should be removed from the base of the tree for a depth of from three to four inches. The surface of the trunk thus exposed should be first scraped and painted and the earth then replaced. This is necessary, for the beetle occasionally lays her eggs under instead of above the ground.

The Auction Market

By Arthur M. Geary, Portland, Oregon.

"If apples of the Pacific Northwest were stored carefully until each variety reached its prime, and then were sold through the auctions of the large Eastern cities, would there not be much wider and quicker distribution at less expense, with greater returns to the growers than under the present method of dealing entirely through the large receiving apple jobbers?" This was the question that I asked a well-known apple jobber of Chicago a month ago. His answer was: "Yes, but we apple jobbers are not going to promote the system that puts the small jobber and broker on the same level with us who have outlets through our stores. We are not afraid of the shippers handling the apples in this way themselves, because the growers are in such a sad financial condition that they could not wait for the returns."

The fact that the growers cannot afford to hold their apples from October to February, March, or whenever they should properly be eaten, is the great obstacle in the way of the Northwestern apple growers deriving the same benefit that the Florida Citrus Exchange and the California Fruit Distributors and California Fruit Growers Exchange obtain from selling their products exclusively at public sale in the large auction centers of the United States and Canada. The big receiving jobber must compete with the little jobber at the auctions, under the auction system. But under the private sales method the little jobber purchases from the big jobber. The consumer buys less at a greater price.

As a prominent marketman in Cincinnati told me: "A buyer abhors to pay profit to another." That is the reason that hundreds of jobbing firms in the United States do not deal in box apples. That is the reason that the consumption



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Winans' Net Tree Support

Prevents fruit-laden trees from breaking, holding the limbs up more efficiently and at much less expense than propping. Holds limbs in place, preventing damage and dropping when the wind blows.

Meshes are large enough so fruit can be picked through them—open at bottom so picker can get inside the net, or net can be removed at picking time.

This net of finer mesh will keep the birds from eating the blossoms or fruit in districts which are thus troubled.

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of fruit sold at auction is increasing at the expense of the demand for box apples.

It is because the sales managers of the different associations and companies of the Northwest realize that the demand for the box apple must be increased that they listen attentively to the arguments in favor of the systematic use of the great public clearing houses for fruit that have been established by the auction companies. Many of the growers appear to be under the delusion that because they are producing a package of great merit the demand and price should be satisfactory.

In order to sell, the box apple must have salesmen. Is it not better to have hundreds of salesmen who get their supplies on an equal basis from the auction, than to have a fewer number who must buy from their larger rivals?

There is great advertising value to be gained from placing a high-class package before all the trade of the city each morning. A prominent official of the California Fruit Growers' Exchange told me in New York: "There is no doubt among the California Exchange officials but that auction selling forces consumption."

My investigations in different cities sustain the belief that the apple growers, as the volume of apples produced in the Northwest increases, will find it necessary and highly profitable to follow in the footsteps of the shippers of California and Florida. The outlets controlled by the apple jobbers at present are too small. The great problem for the apple growers to solve is, "How to Finance their Business?" When that is solved, they can use the auction to advantage.

According to the figures given me by the Boston Produce Exchange, ten more cars of Northwestern apples were consumed in Boston five years ago than during the year closing with June 1, 1915. On the other hand, the reports of the California Fruit Distributors, the California Fruit Growers' Exchange, and the Florida Citrus Exchange show that during the same period there has been a tremendous increase in the consumption of the fruits sold at auction in Boston.

There are over 1,200 cut rate stores in Philadelphia, as well as great numbers in Pittsburgh and other cities. These stores that are endeavoring to reduce the cost of living by avoiding paying unnecessary profits to the middlemen, feature the fruit that they can buy direct from the auction.

In New York last fall, inability to find an outlet for inferior Jonathans that glutted the market sent apple prices to rock bottom. Until late in the spring the apple market did not recover from the depression caused by the Jonathans. If all of these had been fed into the auctions, hundreds of peddlers and small jobbers would have aided in their distribution. New York people would have taken to eating apples. The rate of consumption established would have resulted in the rebound of prices. These Jonathan apples, instead, were disposed of through the slow and tedious method

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of private selling from the jobbing stores. Many of the packages were in an unfit condition when finally offered the consumer.

Jobbers buy to supply existing wants. They do not create new demands. A selling agent for one of the large Northwestern shipping associations in an Eastern city told me that he had been forbidden to supply orders of apples to a string of tea stores by a jobber who furnished one of the main outlets for apples in that particular city. The agents of the California and Florida associations are not so handicapped. They send out market letters the day before each auction sale to large retailers as well as to jobbers.

Protection of Dried Fruit

Recent investigations have shown that the loss to the dried-fruit industry from the attacks of insects is sufficiently great to make it nearly as desirable to put up the fruit in sealed packages as it is in the case of cereals. No exact figures are available as to the extent of the loss, because the injury is usually noticed for the first time by the retailer or consumer, after the product has been widely distributed. The retailer, moreover, is inclined to be reticent about the amount of damaged fruit in his possession, and unless the damage is considerable, prefers to stand the loss rather than return it to the wholesaler. The total damage, however, is unquestionably considerable.

The two insects that do most of the harm are the Indian-meal moth and the dried-fruit beetle. An investigation carried on in California by the Department of Agriculture has shown that the fruit may become infested with these insects in the field, in the packing house, in the warehouse and in the grocery store. Adequate protection against such infestation, therefore, must consist, first, in the sterilization of the fruit before it is packed, and secondly, in the use of cartons through which the insect cannot penetrate.

Dried fruit is usually processed in some manner before being packed, in order to make its appearance more attractive. Figs, for example, are frequently dipped in boiling brine, and this, in itself, is sufficient to destroy all insect life. Other fruits, however, such as the peach, are dipped in cold or lukewarm water. In such cases the addition of a belt heater is suggested as an effective means of destroying insects. By running fruits in a series of belts through a chamber the temperature of which is maintained at 180 degrees Fahrenheit, satisfactory sterilization can be secured. By adjusting the speed of the belt, the time that the fruit remains in the heater can, of course, be easily regulated. The heater should be so arranged that the fruit is delivered into a screened packing room, which will insure it against contamination before packing.

The greatest part of the infestation, however, occurs after packing, and, in consequence, the sterilization of the

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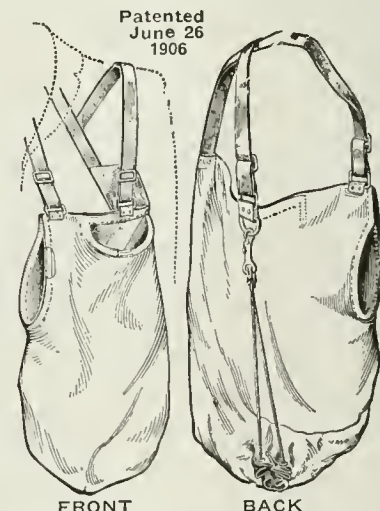
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The bag can be let down to the bottom of the box before opening the drawstring, thus not bruising the fruit.

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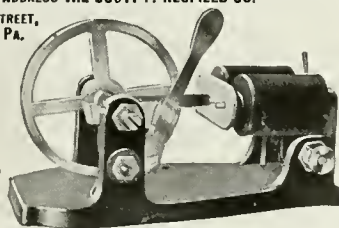
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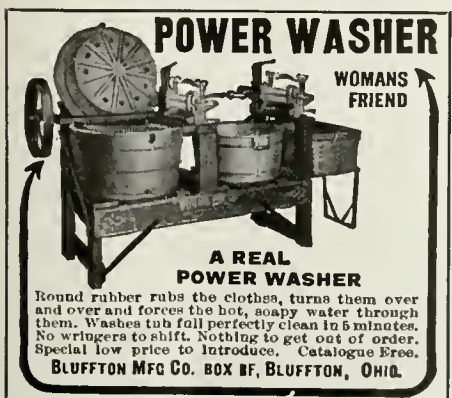
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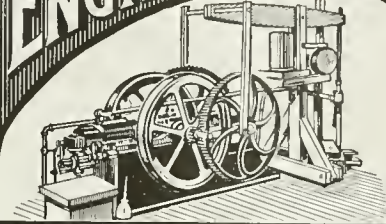


cartons is of great importance. These should be sealed after having been filled and before they are placed in the warehouses or cars. In this way the fruit is not only protected against infestation, but is preserved for long periods in the condition in which it was packed. Fibre-board packages have been found satisfactory containers for the fruit, and sealing can be done in several ways. Machines have been invented, for example, which will rapidly seal small packages of dried fruit and at a moderate cost. One machine designed to wrap cartons 8x3x3 inches, will wrap and seal a minimum of 10,000 a day, at an estimated cost, including all material and the wages of the operator, of less than \$1.00 a thousand. When the output is increased to from 15,000 to 20,000 cartons a day, the cost will be from 80 to 90 cents a thousand. At this rate it is estimated that the machine will pay for itself in a comparatively short space of time, and that the manufacturer will be able to deliver a sealed product which is practically safe from all danger of infestation. Further details in regard to this subject are contained in Bulletin No. 235 of the U. S. Department of Agriculture, "The Control of Dried-Fruit Insects in California."—U. S. Department of Agriculture Bulletin.

Agricultural and Horticultural Association of Kelowna

Kelowna has for several years past held very successful agricultural and horticultural exhibitions organized by this association (previously known as the Okanogan Mission Trades and Agricultural Association). Being in the heart of the Okanogan, the district from which comes the finest agricultural products of the province, and Kelowna fruit, particularly apples, having proved its pre-eminence in competition with fruit from all parts of the North American continent, it will easily be understood that it has been possible to get together very creditable exhibitions, which have attracted large numbers of visitors. The 1915 show is to be held September 27 to 29, and will be much on the lines of the show held last year. The directors feel that this year the firms from whom the people of the district have been obtaining the greater part of their many requirements should be given an opportunity of showing their interest in what is the principal event in the Kelowna calendar, by donating special prizes for the show. Such prizes, particularly if offered for exhibits in some way, if only remotely, related to the business of the firm donating, would add very materially to the attractions of the show, both from an exhibitor's and a visitor's viewpoint, and would naturally draw the attention of the general public to the name of the firm in a way to ensure a very friendly feeling toward that firm. The directors will be grateful for any contribution you care to make to the prize list, and will carry out any reasonable conditions imposed in connection with special prizes donated. I shall be

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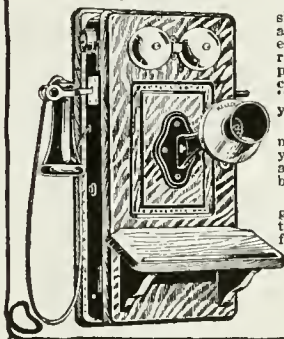
WHAT after all is more worth while than bringing comfort and safety into the home? Think what the telephone has done to tie the country house to the town and the town to the city. Don't be isolated. Get into touch with the voice of the big outside world. Know the prices that rule on farm products. Know about the party at your neighbor's house. Bring to your whole family the safety that comes with the knowledge that in the time of illness or fire the whole community is within call.

Kellogg Telephones

have won their way into homes all over America because of the quality of service they give. Did you know there is a big difference in telephones? There is. Kellogg phones have to undergo an inspection more rigid than other makes. They pass through 37 distinct tests before they leave the factory. That means dollars and cents to you.

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pleased to send you copy of the prize list and any other information you may wish, on being favored with a reply. Thanking you in anticipation of your kind consideration of this application, I am, gentlemen, yours faithfully, P. B. Sudshall, Secretary.

Annual Cover Crops

The annual cover crops should be sown some time during the early part of September. Many people have already planted vetch, some have planted rye or oats in the orchard, and these crops will be up and growing well before the fruit is gathered from the orchard. Early planting is especially valuable in many regions. In regions where winter injury has been common, the planting of some form of cover crops close to the trees in time to make sufficient growth to remove the surplus water from the soil and cause the trees to go into winter quarters without any soft or unripened wood is sure to produce beneficial and helpful results.

Rye is a good crop for this, if sown early. Winter vetch is also a good crop, but has the objection of being very expensive. When once seeded, however, it can be grown as an annual cover crop for several years, if it is let grow in the spring until mid-spring or early summer, when it will have developed seed that will remain practically dormant all summer and start into growth in early fall.

The planting of permanent cover crops, such as clover and alfalfa, should be thoroughly considered before it is undertaken. These crops require that the water supply be sufficient for growing both the orchard crop and the cover crop at the same time. Clover can be grown for one year and then turned under with very beneficial results. Alfalfa can be grown for one or two years and then the surface soil thoroughly disked and worked up until it looks like a plowed field, and in that way a great deal of vegetation that falls on the surface can be worked into the surface soil. Alfalfa is difficult to eradicate and should not be planted until all of its characteristics have been thoroughly considered by the orchard owner. Most orchardists who have planted alfalfa and clover consider clover less valuable and favor alfalfa more and more every year. — O. M. Morris, Horticulturist, Washington Experiment Station.

Canning Demonstration Car on S. P. R. R. Lines

A demonstration car for teaching farmers and others interested the new process of canning by the steam pressure method, is now in operation over the Southern Pacific lines in the Willamette Valley. The tour was arranged by Professor D. Hetzel, director of Extension at Oregon Agricultural College, and H. M. Hinshaw, general freight agent of the Southern Pacific lines. The car is in charge of F. L. Griffin, state leader of industrial club work for girls and boys.

It is the purpose of the demonstration to enable producers of fruits and vege-

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tables to utilize their surplus products by canning, for use either for home consumption or for commercial purposes. A few of the leading types of home canners will be shown, with which fruits and vegetables can be converted into by-products within a few minutes time. Steam pressure raises the temperature in a short time to a degree of heat that is fatal to germs and their more resistant spores, so that when sealed the products will keep for a long time. The cost is shown to be so low that a good profit is made on the work and a supply of home-canned fruits and vegetables and fruit juices can be secured from the home garden and orchard.

The Growing Popularity of the Bushel Shipping Basket

Some fifty factories in the United States make the bushel shipping baskets which are being so extensively used all over the United States for peaches and other large fruits. The popularity of these baskets as a fruit package has been growing from year to year to such an extent that with a good fruit crop generally it taxes the capacity of the factories to supply the baskets. In the East, West, North and South the majority of these factories have sold their entire output this year up to August 15. The approximate production of these baskets in all the factories in the United States amounts to 200,000 baskets per day, three million a month. From this, it can be readily figured that nearly thirty million bushel fruit shipping baskets will be used this year in the United States.

The fruit grower and shipper is usually slow to experiment with a new package, therefore, the use of such enormous quantities of these bushel shipping baskets proves conclusively that it is the cheapest, most practical and best package that can be used for peaches, pears and many others of the larger fruits and vegetables. The price of a basket with round hoop, slatted cover and center post complete at the factory runs from 10 cents to 12 cents apiece. There is no other package of equal size, strength and utility that can be sold at that price. The bushel basket package is ready to ship when the fruit is ripe; no nailing or other preparation is required; it's handy and convenient to handle and last but not least worth really more than first cost to anyone having use for a basket after it has delivered the contents. These are only a few points that have made this package so popular.

The Pear Leaf Blister Mite

The pear leaf blister mite is a very common pest in many districts. It causes the leaves to blacken in spots where the mite is present. These blackened spots represent galls or swellings of the leaf tissue in the center of which the mite resides. When first forming these galls are blister-like and reddish in color. While mainly abundant on pear, the blister mite also may attack the apple, in which case the galls are



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The fifth wheel, that prevents the pulling up and pitching of the bolster, makes it easier for your team to pull a **Columbus** or **Weber** wagon and does away with bent and broken king pins and circle irons. The patent folding endgate and the link end rods save much of your time in the busy season. The high-grade wood, iron, steel and paint used add years to the life of **Columbus** and **Weber** wagons. These things mean economy.

These points are explained in detail in our wagon folders and are pictured so plainly that it's almost like looking at the wagon itself. Some dealer near you handles these wagons and has samples set up for you to see. Drop us a line and we'll send you the booklets and folders. We'll also tell you where you can see a **Columbus** or **Weber** wagon so you won't have to waste any time looking for it. Write to us today.

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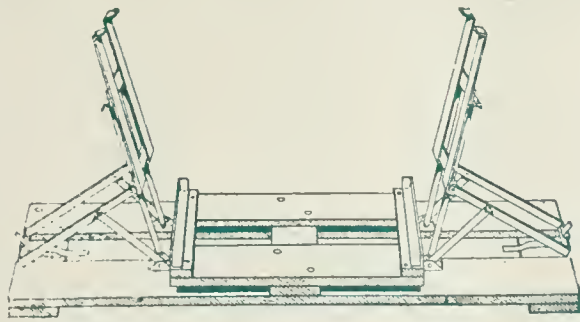
brown in color. During the summer time the mites live entirely in the blisters, producing eggs and young therein. At the approach of cold weather the mites migrate to the bark of the tree, hiding themselves in rough bark around buds and twigs. According to Dr. A. L. Melander, entomologist of the Washington Experiment Station at Pullman, the best control measure seems to be a spraying of sulphur-line given in early spring, when the buds are swelling. After the mites have entered the leaf tissue they cannot be exterminated, although spraying with colloidal sulphur is claimed to afford some relief. This finely-divided sulphur keeps the mites from spreading, especially to the fruit. In case of bad infestation the fruit is scarred with similar blisters.—Washington State Agricultural College Bulletin.

Mr. H. E. Smith, of Payette, Idaho, who has an extensive acquaintance with the fruit growers in Idaho, and a large acquaintance with the trade, having been one of the district sales managers for the North Pacific Fruit Distributors for the past few years, with headquarters in Chicago, is going into business for himself, having issued a circular which is headed, "H. E. Smith, Marketing Agents, Northwestern Fruits, for Idaho, Washington and Idaho, in box apples, prunes, peaches, pears, etc., with headquarters in Walla Walla, Washington."

Yakima reports convey the information that through the efforts of W. H. Paulhanus, president of the Growers' Council, and H. F. Davidson, the prices on Bartlett pears were advanced in August from \$15 a ton to \$17.50.

Coming Events

Chehalis County Fair, Elma, Washington, September 1 to 5.
California State Fair, Sacramento, California, September 1 to 11.
Columbia River Interstate Fair, Vancouver, Washington, September 6 to 11.
Washington-Idaho Roundup, Garfield, Washington, September 9 to 11.
Colorado State Fair, Pueblo, Colorado, September 13 to 18.
Spokane Interstate Fair, Spokane, Washington, September 13 to 18.
Walla Walla Fair, Walla Walla, Washington, September 13 to 18.
Montana State Fair, Helena, Montana, September 20 to 25.
Washington State Fair, North Yakima, Washington, September 20 to 26.
Latah County Fair, Moscow, Idaho, September 21 to 25.
Nelson Agricultural Fair, Nelson, British Columbia, September 22 to 24.
Cowlitz County Fair, Woodland, Washington, September 23 to 25.
Utah State Fair, Salt Lake City, Utah, September 27 to October 6.
Oregon State Fair, Salem, Oregon, September 27 to October 2.
Lincoln County Fair, Dayenport, Washington, September 29 to October 1.
Western Montana Fair, Missoula, Montana, September 29 to October 2.
Wilbur Fair, Wilbur, Washington, October 5 to 8.
Stevens County Livestock Show, Colville, Washington, October 26 to 29.
Arizona State Fair, Phoenix, Arizona, November 8 to 13.
Cascade International Stock Show, North Yakima, Washington, November 22 to 27.
Lewiston Livestock Show, Lewiston, Idaho, November 29 to December 1.
Pacific International Livestock Exposition, North Portland, Oregon, December 6 to 11.



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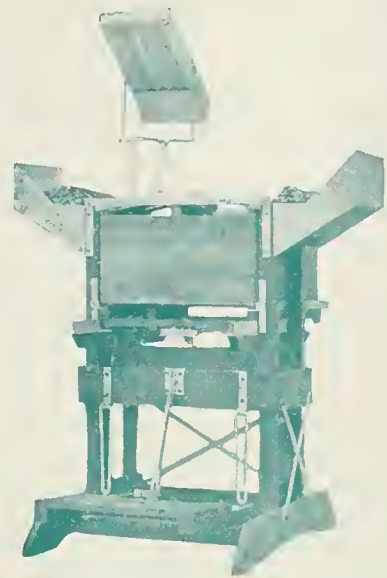
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A Poorly Pressed and Nailed Box is a poor advertisement of good fruit

The appearance of the package carries with it either a good or bad impression of the contents.



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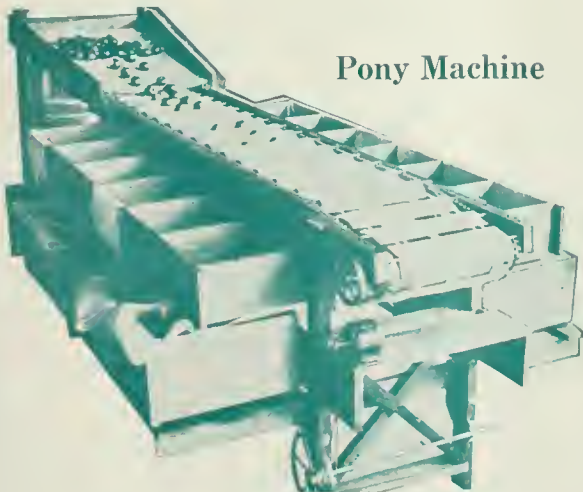
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Sizes three grades at a time. Capacity two carloads daily. { First grade into nine sizes.
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Sizes two grades at a time into four or six sizes as desired.
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Either machine can be used for boxes or barrels. Openings on both machines expand uniformly from 1½ inches to 4 inches square.

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Machine discharges the fruit into boxes or barrels without bruising.

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The World

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VOLUME X

OCTOBER, 1915

NUMBER 4

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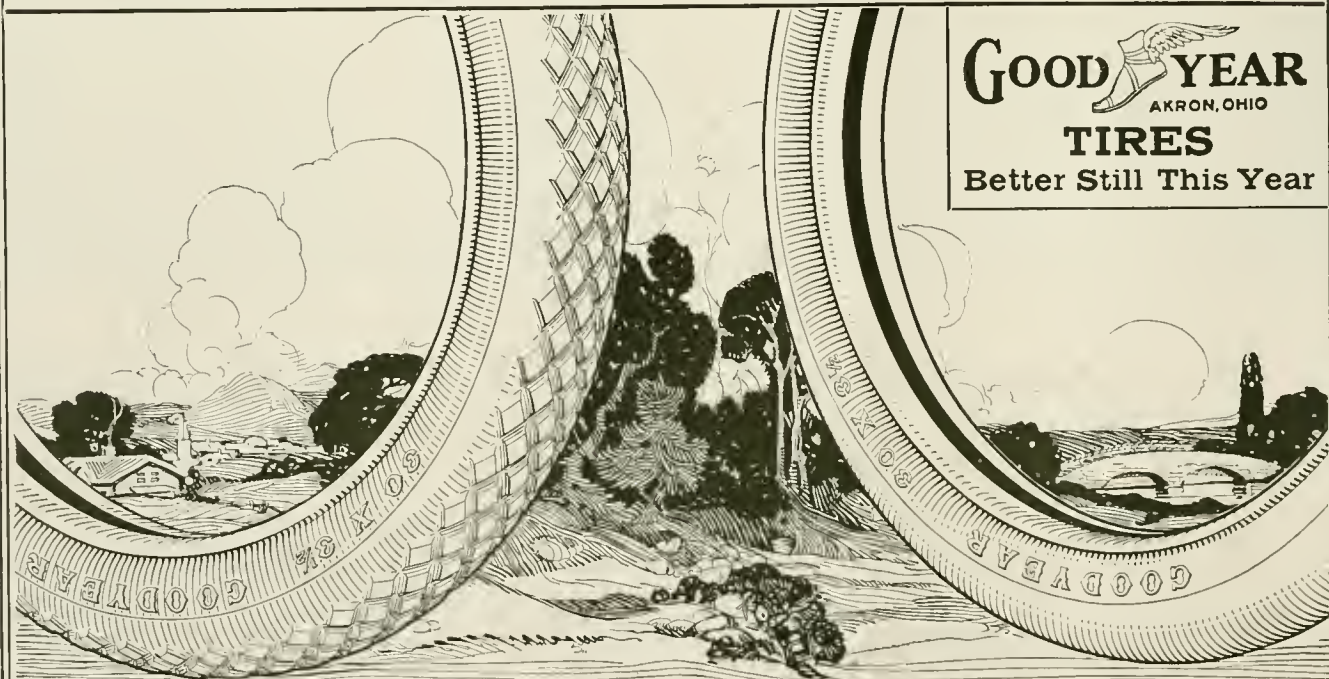
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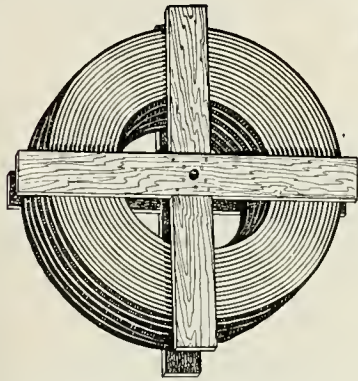
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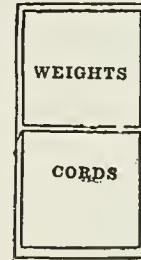
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The Study of Fruit-Buds

By E. J. Kraus, Oregon Agricultural College, Corvallis, Oregon.

IF the fruit-buds are regarded as the actual fruit-manufacturing machinery of a tree, it is necessary to know something of where they are located, how and when they are formed, and how they should be treated. For convenience, they may be classified according to their particular location on the tree, namely, terminal buds (on shoots), axillary buds (on shoots) and

though at times from that which is older. They develop either from single terminal buds, as is general in plums and prunes or from one to several lateral buds, as in apples and pears. Depending on variety and environmental conditions, these annual increases in length may vary from a fraction of an inch to several inches, with the result that the older spurs may be very compact, or loose and spreading. In some instances large spurs consist of as many as forty or fifty buds on more or less angled branches. A fruit-spur, then, may be a single short branch bearing one or a few fruit and leaf buds, or a large aggregation of such branches which arise from one another.

The proportions of the several classes of fruit-buds vary greatly, according to the kind and variety of fruit. In the peach, particularly, all the fruit-buds are axillary and borne on one-year wood. Some of the annual branches are so short that they might be regarded as spurs perhaps, though the proportion of buds borne on such spurs, as compared to the total number on the tree, is small. In this particular class of fruits the fruit-buds, which usually contain one or sometimes two flowers, are borne singly on one side or the other of the leaf-buds, or in pairs with a leaf-bud between them. They are usually more numerous toward the tips of the branches, though when the trees have been properly kept open to admit light and air they are plentiful on the smaller laterals and scattered well along the branches, except at the bases of the larger ones. In the plum and prune fruit-buds are borne both on one-year shoots and on spurs. Most Japanese varieties have large quantities of axillary buds, much as has the peach, except that frequently there are more than two buds at each node. The number of axillary buds on one-year-old wood in the case of the common varieties of prunes should be regarded as small as compared with those on spurs, though one-year-old spurs are often prolific bloomers. The sweet cherry bears its fruit-buds either on spurs or as

axillary buds on one-year-old wood. If the one-year branches are of any considerable length, it is worthy to note that the fruit-buds on them are borne near the base, or at least the basal one-half. Apples and pears may be considered together, since the methods of fruiting are similar. The fruit-buds are borne on spurs, as axillary buds, or terminals on one-year wood. Varieties vary greatly in this regard. Some have a large proportion of their fruit-buds on one-year wood, especially while young, while others bear very few such buds, having practically all, except a very few terminals, borne on spurs which sometimes are present on one-year wood. Attention is called to the fact that, normally, the axillary fruit-buds are borne near the tips of the branches instead of the base, just the reverse of the condition prevailing in the sweet cherry.

In apples and pears it is frequently objectionable to have fruit borne at or near the tips of long one-year branches, because such branches are bent with the fruit and become misshapen, are swayed with the wind, and thus bruise not only the fruit they bear but all in the immediate vicinity, and tend to bring the fruit to the very outside of the tree, so that even a light load is apt to cause breaking. Yet it is undesirable at times to remove all such fruit-buds, because they may constitute a large proportion of the entire crop. If it were possible it would be of much greater advantage to have them borne on short laterals so that they might be



FIGURE 15. Bartlett pear twigs showing at *a* numerous axillary buds; *t* terminal buds; *f* a fruit-spur which bloomed last year but set no fruit and from which vigorous side branches have grown; *b* fruit-spurs which bore fruit last year and are producing blossoms this year at *s*.

those borne on spurs. The terminal fruit-buds are those which are at the very tip or terminus of a shoot. In certain varieties of apples such as Jonathan, Gravenstein, Newtown and others, and in some varieties of pears, notably the Bartlett, Winter Nelis and Angouleme, much of the first crop of fruit-buds is borne terminally on shoots. The axillary buds are also borne on one-year-old wood, but on the sides of the shoots instead of at the tips. The third class of buds, those borne on spurs, which are really nothing more nor less than very short branches, are borne either singly or in aggregations of twos, threes or many. Generally they are developed first from either one or two-year-old wood,



FIGURE 16. Bartlett pear. At *s* fruit-buds produced laterally from a spur which bore last year.



FIGURE 17. Winter Nefis. Fruit branch taken from an old tree. Note that the greatest number of fruit-buds are borne on vigorous new wood produced by thinning out old spurs. The old unpruned spurs bear mainly leaf-buds.

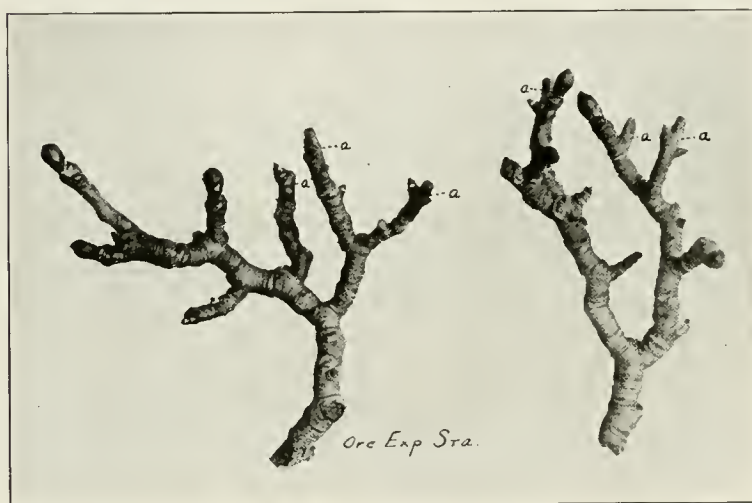


FIGURE 18. Bartlett pear. Old spurs which have been blooming annually but setting a very small number of fruits. At *a* spurs which bloomed but set no fruit, some of them again producing fruit-buds the following season.

saved to produce fruit. Such a condition actually can be brought about, especially with young trees, through a method of early summer pruning, whereby some of the branches, instead of being allowed to grow normally, are headed back sufficiently early in the season to allow laterals to spring from them and develop terminal and even axillary fruit-buds.

The amount of pruning to be done in winter on any variety of fruits so as to produce the maximum number of fruit-buds depends upon so many factors that no specific recommendations can be made. Two facts must be observed, however, when dealing with normal apple or pear trees of average vigor, and, in a general way, all other deciduous-tree fruits. First, if a large amount of wood is removed in heading back a one-year-old branch, lateral branches, and not fruit-buds, will be produced from the remainder. Second, if the heading back is very slight, fruit-buds may and are apt to be produced, but they are likely to be borne near the

cut, with the result that below them few or none of the buds will break and long barren spaces on the branches will exist. It is a safe rule to bear in mind that the greatest influence is felt in the vicinity of a pruning cut. Thus, if a long branch is cut back severely, the greatest growth response will come near the point of cutting, though there will be some response throughout the whole limb. Or again, if a dense or tall pear tree, for example, has the top cut back without a thinning out or cutting back of the remaining branches, the first or greatest response will be near the cut. This principle is of importance in pruning very old trees in which masses of spurs have been formed, but which are not producing annual profitable crops. Annual crops of bloom are produced, but the crop of fruit is light, and what is produced is often inferior. In such cases it would be better to remove some spurs entirely and thin out others in order again to bring about a vegetative response directly within the remaining spurs themselves rather

than to take out many large branches or merely to cut back the top or saw off the ends of all large limbs. Such a spur pruning may not be advisable each year, but will serve as an occasional rejuvenating means. The removal of some branches will probably be necessary in conjunction with the spur thinning, and of course the removal of all dead wood is essential. The main point to be emphasized, however, is this: There will be less unbalancing of the trees and more real stimulation to fruit production if the cutting is distributed rather than more or less localized. Figure 18 represents part of two very old spurs. They have been producing fruit-buds and flowers for many years, but have matured but few fruits, due to a lack of vegetative vigor. Figure 20 shows a portion of a spur which had been thinned and shows a strong, almost too vigorous vegetative response as a result, while Figure 22 illustrates how these vegetative shoots again become strong fruit spurs in the course of two or three years.

In this connection attention is called to those lateral branches of moderate length which bear terminal fruit-buds and are frequently abundant in young trees just coming into bearing. If not excessively long, say not over twelve inches, it is the best policy not to remove the terminal bud, since if it is left to remain the chances of having the lateral buds on such a branch develop into fruit-spurs are much greater than if the branch is headed back. Even if fruit does not set from such a bud, the beneficial effect is greater if it is not removed. Of course if the branch is excessively long and limber head it back. Frequently, in pears and in many varieties of apples, such laterals of from three to eight inches in length, if left alone become the first really productive areas of the tree, but are ruined if removed or heavily cut back. This statement is in no way intended to discourage the practice of shortening in or heading back those more or less numerous lateral, vegetative branches which frequently grow in large numbers in the lower inner portions of young trees. In fact there is reason to believe that if some of these branches are allowed to remain and are cut back to three or four inches in length they can be developed into early and valuable fruiting wood.

The time or season during which fruit-buds are formed is a matter worthy of consideration. The practice of summer pruning largely hinges on such a knowledge, because if the pruning is done at one season of the year, and is to have an immediate effect, sufficient time must be allowed for fruit-buds to develop during the part of the season which remains. The amount of cutting that may be permissible early or late in the season is entirely different. Early summer pruning may, and sometimes should, be heavy to bring about a vegetative response, while a late summer pruning must be light in order that a heavy vegetative response may be avoided. Too late a summer pruning may fail of its purpose abso-

lately, either by forcing worthless vegetative shoots or causing leaf buds to start which do not have sufficient time for reorganization into fruit-buds. Roughly speaking, trees have a growth period and a dormant period, though in fact certain changes are going on throughout most of the dormant period. Changes take place within a bud and determine whether it will become a leaf or fruit-bud in the apple or pear as early as the latter part of June and proceed throughout the summer and fall. The very beginnings of fruit-buds are also visible as late as the latter part of August, so that apparently there is actual differentiation of buds occurring throughout the summer. Usually this differentiation takes place first in the buds on the spurs, then those in the axils of the leaves, and finally in the terminals. Depending on conditions, the order may vary, depending on the vigor and growth of the shoot, especially among the terminals. In fact the order may be reversed, or they may form at about the same time. With minor exceptions fruit-buds for these particular fruits go into the winter in practically the same state of development. But slight advance takes place during the early part of the dormant season. Later numerous microscopic changes go on, and these, in late winter and early spring, occur even more rapidly, until finally the swelling of the buds becomes very evident and blooming follows in course of time. Knowing the period at and during which fruit-bud formation takes place, one is better able to modify orchard practices so that the best possible conditions for their development can be brought about. Such buds are influenced by many conditions other than pruning, such as moisture, light, air and food, but it is the former means with which this discussion is most concerned.

The relation or balance which seems to exist between the so-called vegetative or growth tendencies and the reproductive or fruit-producing powers of a tree is a delicate one and can be brought about or maintained only by the careful observation of each individual tree and its response to any treatment given. Suffice it to say that it is easily possible to have too many fruit-spurs or fruit-buds in a tree; so many in fact that the energies of the tree appear to be used up merely in the production of bloom, and such fruit as may be produced is inferior both in size and quality, as previously pointed out. The aim must be to produce or maintain, not the greatest possible number of spurs, but the most efficient fruit-spur system, which means that the spurs shall be evenly distributed throughout the whole tree, that there shall be ample room between and among them, and that they be healthy and vigorous. The same ideas as outlined for fruit-spurs hold true for the fruit-buds of the peach. While the total number of fruit-buds produced might be greater on an unpruned tree, and it is true that large numbers of them are lost from winter pruning, yet it is better to remove some branches



FIGURE 19. Bartlett pear. Old spurs which have set an average number of fruits in previous years. At *a* spurs which bloomed but set no fruit, again producing fruit-buds for the following year. At *b* the same, except no fruit-buds produced.

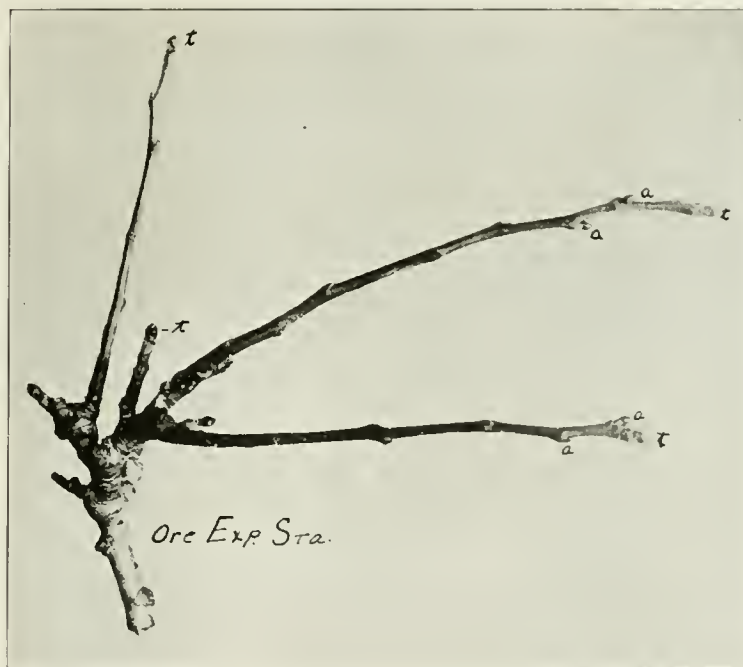


FIGURE 20. Bartlett pear. Vigorous vegetative response from thinning spurs. Terminal fruit-buds at *t*; axillary fruit-buds at *a* on one-year shoots.

entirely and to shorten back others and admit light and air into the tree to strengthen the remaining buds and maintain proper vegetative condition than to allow it to spread out and lose practically all its lower and interior fruiting area and produce only at the ends of the branches toward the outside.

Finally, then, it is necessary that a careful study be made of the fruit-bud-producing habits of any variety under any given set of conditions. There are localities in which trees tend to produce an excess of fruit-buds when com-

pared with the production of vegetative shoots and care must be exercised in pruning that the ideal relationship be maintained by either a heavy heading back or thinning out. Again the tendencies may be in the opposite vegetative direction, and unless great care is exercised the trees are unproductive or do not come into bearing for many years. In such cases great caution in heading back must be exercised, and frequently methods of control other than pruning must be resorted to. The question of annual bearing of varieties is of great importance to every fruit-



FIGURE 21. Bartlett pear. A good vegetative response from thinning spurs. Note the numerous fruit-buds at *s* on spurs which did not break into long branches. Terminal buds at *t* and axillary buds at *a* on one-year shoots.

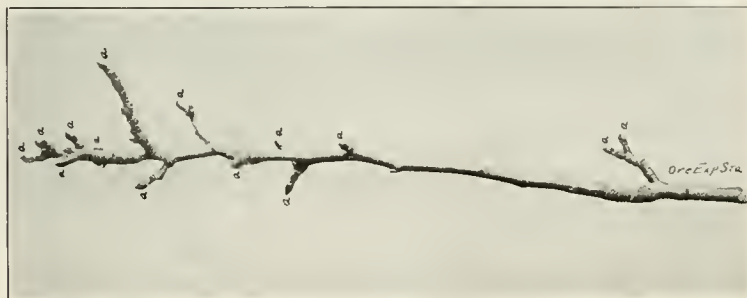


FIGURE 22. Bartlett pear. A vigorous shoot produced from an old spur which has been pruned, now in a healthy productive condition. Note the numerous fruit-buds present.

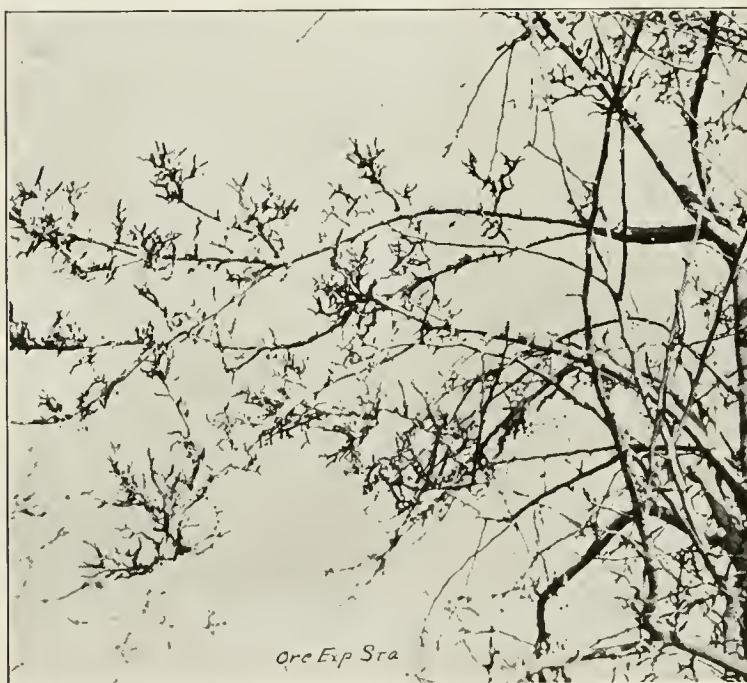


FIGURE 23. Large branches from an old Bartlett pear tree. Numerous fruit-spurs but very light vegetative growth.

grower. It would be a difficult task to make all varieties of apples annual bearers, since if it is not a characteristic of any variety so to bear special methods of pruning or culture would be required to change the entire constitution of the tree. On the contrary, some varieties will bear annually even under the most adverse conditions. Generally speaking, those varieties which produce fruit-buds liberally on one-year wood, either as axillaries or terminals, come into bearing younger,

and are more likely to bear annually than those which bear on spurs exclusively. It should not be overlooked nor forgotten that while it may be normal for spurs to bear only during alternate years, such is by no means always the case, and blooms and even fruits are often produced each successive year for a number of years. This is notably true of several varieties of pears, especially the Bartlett, which like the Wagener and Jonathan apples is an excellent example, also of a vari-

ety which produces an abundance of axillary and terminal fruit-buds. The following table, based on a range of average Oregon conditions, will serve to give information concerning the more common varieties of apples and pears:

TABLE I.—RELATION OF POSITION OF BLOOM TO BEARING IN THE COMMONER VARIETIES OF OREGON APPLES AND PEARS.


Variety	Bloom on terminals	Bloom on axillary buds	Annual bearers
Apples			
Arkansas	None	None	No
Baldwin	Some	Some	No
Bellflower	Rarely	Few	No
Ben Davis	Abundant	Many	Yes
Gravenstein ..	Many	Few	Yes
Grimes	Many	Rare	Yes
Hyslop	Many	Many	Yes
Jonathan	Many	Many	Yes
King	Few	Rare	Yes
McIntosh	Few	Few	Yes
Newtown	Some	None	No
Rome	Some	Very few	No
Spilzenberg ..	Few	Rare	No
Transcendent ..	Many	Many	Yes
Wealthy	Many	Many	Yes
Winesap	Many	Many	Yes
Pears			
Anjou	Few	Very few	No
Angouleme	Yes	Yes	Yes
Bartlett	Yes	Yes	Yes
Bosc	Some	Very few	Nearly
Clairegeau	Yes	Yes	Yes
Comice	Few	Few	No
Howell	Yes	Yes	Yes
Winter Nelis ..	Yes	Yes	Yes

In 1914 very few apple growers made any money; most of them did not realize enough to pay the cost of production. In 1915 it is expected that the growers will be able to obtain reasonably good prices, without question. But even so, to make up for the loss last year it will be necessary for the apple growers to make effective every system of efficiency and economy that is possible in harvesting the apple crop.

Chelan, Washington, shipped the first carload of apples June 11th, consisting of Gravensteins, Red Astrachans and Red Junes.

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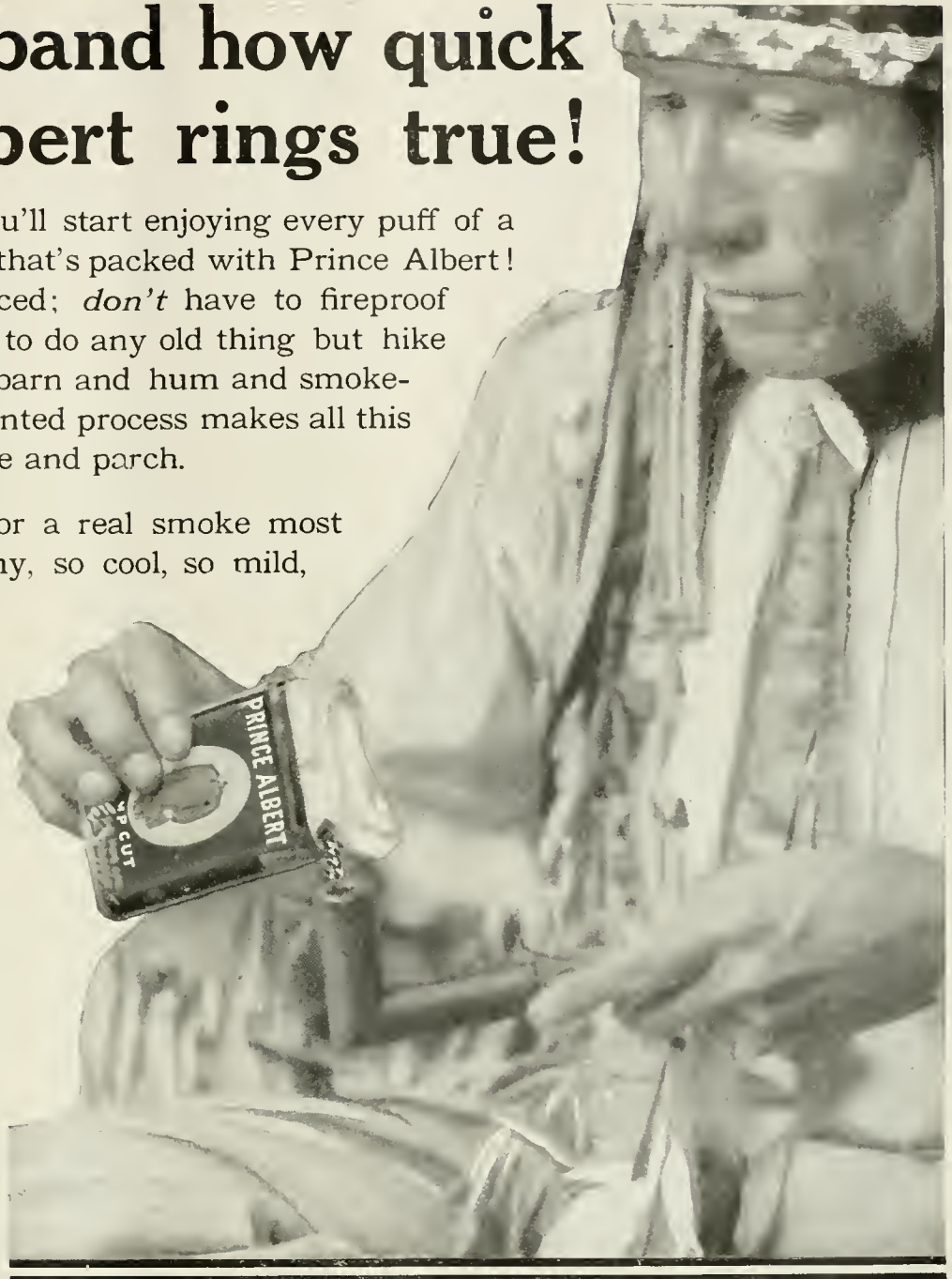
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Prince Albert is sold everywhere in toppy red bags, 5c; tidy red tins, 10c; handsome pound and half-pound tin humidors; and in pound crystal-glass humidors with sponge-moistener tops that keep the tobacco in the finest possible condition.



Here is a photograph of one of the finest types of Indians now living, Chief Eagle Shirt, an ardent pipe smoker, who hails from the Pine Ridge Reservation. The Chief is 32 years old, and is one of the star attractions with "101 Ranch."

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The Apple as a Farm Product—History and Present Status

By A. Millard, Jr., Hood River, Oregon.

MARKETS, "local" and "unclassified," are then pretty well out of the question, except for locally-produced fruit, and for anything like distance shipment, the grower must turn to the primary market. The largest primary markets for apples in about the order of their importance may be listed as: New York, Boston, Philadelphia, Chicago, Cincinnati, Baltimore, St. Louis, Pittsburg, San Francisco, New Orleans and Seattle. We will leave the question of domestic markets here and proceed to take up in some detail the foreign markets. The writer realizes that more than proportionate emphasis is laid below on foreign markets. However, the subject is most interesting to all fruitgrowers and dealers, and is especially vital to the growers of the Far West, and since their grades of fruit are more in demand abroad than the general grades of Eastern fruit, the Western growers will do well to follow up this matter very vigorously.

About 7 per cent of the United States apple crop is marketed overseas each year, and this fruit tends strongly to be the best class of fruit and to be more uniformly and safely packed. This preference has favored the strictly graded Northwest boxed apple, but the handicap of the transcontinental freight rate to the Atlantic seaboard for European shipment has largely offset this. Foreign markets seem to prefer the boxed fruit, but barreled apples are generally delivered, per bushel, cheaper (barrel equals three bushels). In England, always the chief foreign market for apples, there has been built up by many years of custom the liking for barreled apples of certain varieties, notably the Baldwin; this is a distinct advantage to Eastern barreled fruit. There are many difficulties attendant on foreign shipments of apples, as there are in any foreign trade, and de-

velopment of foreign markets must proceed very slowly, since transportation, refrigeration, storage, and most important, trade relation facilities, can only be built up in time. Our Yankee methods run into many stumbling blocks as soon as we get away from our own shores, and conservatism is the only successful practice when dealers over the seas are to handle our output.

The markets outside of the United States are briefly considered country by country below. (Much of the text and all of the tables not otherwise specified on the subject of foreign markets here are from R. M. Rutledge, "Better Fruit," Vol. IX, No. 1, and from S. S. Lamb's article based on consular reports published in "Better Fruit" May, 1914.)

Great Britain should be mentioned first. This was our earliest and has always been our largest market. Liverpool, London and Glasgow have always taken most of our exports of apples. England imports large quantities of apples from the United States and Canada as well as from other countries. Their relative importance is shown by the following approximate percentages:

TABLE XV.—ENGLISH IMPORTS OF APPLES.

Country	1911	1912
United States	44%	43%
Australia	9%	10.5%
Belgium	0.8%	1.3%
Canada	11%	12.7%
France	1.6%	0.4%
Portugal	2.6%	2%
All others	1%	0.6%
	100%	100%

Total imports in cwt.s., 3,332,618 3,881,916

Distribution by the importing fruit brokers is either by private sale or by auction. When large quantities are to be dealt with, the latter method is most general, but where the supply is short, private sales are frequently better. Brokers prefer to be in a position to adopt either method according to their judgment of market conditions at the time. The 1912-13 American exports to Liverpool were 35% of total United States export barreled apples and 22% boxed apples; London 19% barreled and 38% boxed; Glasgow 18% barreled and 7% boxed. Of the boxed apples taken into Great Britain, Washington supplies about 60% and Oregon and California each about 20%. Appendix tables give exact export figures, etc. England is a large but a very close market for all fruits. There are some strong variety preferences; the Elberta peach, for instance, is practically the only peach marketed in London. The writer has been told by M. W. French, apple exporter of New York City, that at a fair price the English market for Baldwins was unlimited, but that the market for any other variety went "all to pieces" as soon as any above normal shipments were made. The heavy expense of placing apples on the English market is rather discouraging; the Panama Canal should materially aid

the Western grower. In 1912-13 best quality Yellow Newtowns brought \$1.22 to \$1.94 per half box; the red apples \$1.09 to \$1.94; "choice" boxed apples brought from \$2.18 to \$4.86 per box. Australian Spitzenbergs, in the opposite season, brought about \$1.65 per forty-pound box. Newtown "104s" to "144s" are the preference Western apple. Gravensteins and Jonathans have been mentioned as well liked early apples; Spitzenberg, Staymen, Winesap and Rome Beauties as late varieties, and Ben Davis and Blacks as very late varieties from the West, which are specially desired. Some apples are raised in England, but the climate is unfavorable; they are generally of a very poor quality, and as competitors they are negligible.

Germany imports large amounts of apples, chiefly from the United States and Australia. In 1912-13, 300,000 boxes and 230,000 barrels were handled at Hamburg, the barrels coming from Eastern States and Canada, and the boxes chiefly from Washington and Oregon. Hamburg is the distributing center for all Germany. In 1912, what were called low prices prevailed, with three times the usual shipments of apples, the prices per wholesale box ranged from \$1.66 to \$2.14.

Apples are the only United States fruit sold in France, and practically all these come from the Northwest. After a bad local season, there is a good market for apples. They sell, retail, on Paris fruit stands for from five to eight cents apiece. The French market depends entirely upon the local production of fruit and for this reason is so unsteady from year to year that shipping apples to France steadily is something of a speculation.

Belgium's imports of apples are considerable, through Antwerp by way of London and Southampton. The market is controlled by London, and only the best quality apples sell, local pro-

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duction taking care of the poorer grades. The United States ships a good proportion of the apples consumed. Canada and South Africa also supply some. This market is characterized by irregular shipments and fluctuates badly. Denmark, Norway and Russia buy our fruit. One million pounds of apples and pears were exported from this country to Norway in 1910. American apples brought in this year \$4.86 to \$6.07 per wholesale barrel, in Stavanger, but shipment to the markets of all three of these countries is very expensive, since it includes repacking, or at least reloading at English ports. There are some home-grown red apples in Denmark, but American apples are imported through Hamburg and the English cities, to Denmark.

In Russia there seems to be no chance for increased sales. Very little fruit is eaten and the country is measurably self-supplying. Conditions in The Netherlands are similar to those in Belgium, and though there are excessively high import freight rates at Rotterdam, a few American apples find their way to that country. This completes the survey of the countries shipped to via the English Channel.

In past years Austria-Hungary has paid very high prices for a limited amount of the best fruit; well-to-do classes have purchased American fruit out of the fresh-fruit season in that country. Hothouse out-of-season Australian fruit shipped in 55-lb. wooden packages has brought excessively high prices there.

There is, generally speaking, no market for American fresh fruit in any of the Mediterranean countries. These countries produce such an enormous amount of fresh fruit at prices with which it is impossible to compete that there appears to be no opportunity for American fruit interests in that region.

In the Northwest, Asia is generally thought of as a big market for apples, but as a matter of fact only small quantities of first-class stock is demanded. Only the most wealthy classes of natives in these densely populated coun-



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tries can purchase American apples, and these few, with the small foreign colonies in the larger cities, make up the market. Hongkong imported 11,000 boxes of apples from all countries in 1912-13, and of these 2,000 boxes came from Hood River by way of Seattle, and 6,000 were second and third-class apples from San Francisco. Certain Western growers can supply this market to advantage, but it is a question of individual business relations and not at all a normal market.

Australia imports dried fruit and exports fresh fruit. They are strong competitors of our apples, though they are always marketed in the opposite season. The following figures and tables are from the "Official Year Book of the Commonwealth of Australia" (Boston public library). 47,749 acres of fruit were planted in Australia in the last ten years. The main increase in Tasmania (16,383) and Western Australia (12,118) is due to the extensive plantings of apple trees with a view to the London market for fresh fruit.

TABLE XVI.—TOTAL ACRES ORCHARDS AND FRUIT GARDENS AND ACRES PER ONE THOUSAND POPULATION FOR AUSTRALIA.

Years	Acres	Population
1901-1902.....	116,775	28
1907-1908.....	169,299	41
1908-1909.....	171,558	41
1909-1910.....	178,798	41
1910-1911.....	185,156	42
1911-1912.....	191,521	43

Note—Australian fruit ranges from the tropic pineapple and mango to the temperate apple, strawberry and gooseberry.

Australian fresh-fruit imports consists chiefly of bananas from Fiji; oranges and lemons from Italy, and out-of-season apples from Canada. Their 1911 fresh-fruit exports amounted to £420,780 (£594 of this was re-exported). This fruit was chiefly apples, and they were sent to the United Kingdom, Germany, New Zealand, Brazil,

U. S. A. and India. The following table gives an idea of the fruit trade of the commonwealth:

TABLE XVII.—AUSTRALIA'S NET IMPORTS OF DRIED FRUIT AND NET EXPORTS OF FRESH FRUIT.

Year	Quantity.	
	Pounds	Value
1901.....	13,423,735	£165,099
1907.....	8,000,000	57,864
1908.....	8,000,000	64,159
1909.....	12,000,000	108,046
1910.....	9,000,000	71,311
1911.....	5,000,000	15,012

NET EXPORTS OF FRESH FRUIT

Year	Quantity.	Value
	Centals	
1901.....	.....	£11,031
1907.....	246,482	17,591
1908.....	211,585	19,257
1909.....	121,397	18,168
1910.....	326,928	19,513
1911.....	313,088	12,592

Of preserved fruit in 1911 Australia imported £67,620 worth and exported £29,245.

The following figures and quotations from the 1913 New Zealand Official Year Book are of interest, more as production figures of a compelling country than as applying to a prospective foreign market: "Each succeeding year shows a marked increase in area planted to commercial orchards in the Dominion." For the four years ending December, 1912, 7,413 acres were planted, and 2,420 acres were estimated

Western Pine Box Sales Co.

HIGH GRADE FRUIT BOXES
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for 1913; the total 1913 area would then be 38,720, as compared to 31,953 for 1910-11. "A good market exists locally for choice, clean fruit, but as large areas recently planted come into bearing, growers will have to look to outside markets to take the surplus, and it is hoped that the export of fruit will become in time one of the largest of the Dominion." 33,000 cases of apples were shipped to South America in 1913, and "this market will be able to absorb all the Dominion can supply for several years to come at satisfactory prices to the growers."

The exports of Canada to the United Kingdom were as follows:

TABLE XVIII.—CANADIAN EXPORTS OF DRIED AND FRESH APPLES.

	Fresh Apples	Dried Apples
1908.....	\$4,122,722.00	\$11,687.00
1909.....	2,692,233.00	41,269.00
1910.....	1,184,878.00	86,084.00
1911.....	1,598,359.00	16,013.00

Canada imported no green apples, and practically no dried apples (\$48) in 1912, while she imported \$226,239 worth of oranges, lemons, limes, etc.

Our apple trade, with our sister continent, has been very undeveloped. Now, however, due to the increasing prosperity of South America, exportations of American apples are finding their way into that market. At present the industry is only in its infancy, but it is hoped that the solidity of the American apple will enable it to travel long distances and to hold its own against

all comers. Argentina, Brazil and Uruguay all have small importations of our apples, but due to the fact that refrigeration facilities are very inadequate on the few transportation lines between our ports and those of South America, these have been very limited in quantity and very costly when landed in trans-equator ports. American apples are unknown in Chili, as well as in many parts of the west coast, but with the advent of the Panama Canal this will probably be remedied. Venezuela imports some of our apples from the Northwest, but it is only at great cost incurred by shipping over the isthmus; these are North Pacific apples. Mexico started some importation of our apples some years ago when refrigerator cars could be sent to Mexico City, but due to the unsettled condition of the country and the impossibility of maintaining rapid transportation, this has ceased. The South American markets can never rival England or Germany as an outlet for apples from this country in quantity, but trade south of the equator promises more proportionately to the apple industry than does any other market in sight. This applies especially to best quality North Pacific stock.

The foreign market question is an involved one at best, and with war aftermath conditions in Europe we cannot tell what exports can be counted upon. France is said to have recovered very rapidly in a commercial way after the disastrous war of 1870, and apples sold in Europe are always sold to the wealthier class, who will be least embarrassed after the war.

If there is one place more than any other where business ability in apple marketing will count, it will be in the disposition of apples over the seas.

The man who would know how to sell his apples must first study and understand some of the fundamental principles in the exchange of farm products. Apples are not sold today in the same manner as they were sold a hundred years ago. It is not necessary to know how apples were sold then in order to know how they are sold today; that subject can be more quickly studied by itself; but it is necessary to understand the history of the trade in apples in order to judge how they will be sold tomorrow. There is no question

in the whole subject of commerce and trade that is more distinctly in a developing stage than of the distribution of farm products. Unsettled phases of this distribution are working out their destiny, and the man unaware of this evolution can hardly avoid being left behind in the race. The subject of the distribution of farm products needs no advertising to make it a pertinent question—it is a popular issue already—it is a cry of the day. This means that biased and baseless opinions and criticisms will be expressed, but it also means that a solution of the problems will be hastened by publicity.

The man who would sell his apples intelligently must know the lessons the past has taught, and must view the present question with a broader perspective than petty, individual or even community problems. He cannot afford to implicitly accept the conclusions of others; these matters are too undefined to allow of settlement by any one opinion. He must realize that there is an excess of apple plantings in America, but he must not stop here, for he would then be no better off than if he firmly believed that there were an insufficient supply of trees. He must follow the matter out. How will these large crops to come affect him, and through what agencies, and what may he do to place himself in the most advantageous position to meet the necessary competition. The man who would market apples must know who eats his fruit and how much is paid for it, and what other

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Hood River Apple Vinegar Co.
HOOD RIVER, OREGON

fruit is offered to those who are to select his apples and at what price. He must decide whether he should sell his own crops or sell through associations, and he must know where he may most advantageously dispose of his fruit.

Such preparation is not easily obtained, hence the weeding out will take place rapidly; but the man who is thus armed for this competition can hardly fail to succeed.

Newspaper reports indicate that the apple growers of New York State, realizing the apple crop is short this year, at the present time are very firm in their ideas of prices. It is stated that New York growers, believing the crop to be one-half of last year, think apples should sell for twice the money sold at in 1914. Those who sold at \$1.25 are asking \$2.50 per barrel this year. There are many who are holding for \$3.00 per barrel for Standard Baldwins. Very few sales have been reported up to the present time. Dealers operating in New York State intimate that the price from \$2.00 to \$2.50 ought to be the limit for this year's crop. Dealers believe that by starting the crop off at a moderate price consumption will be stimulated at the beginning, the demand kept up throughout the season and a better average price obtained.

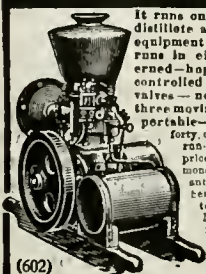
Mr. J. A. Westerlund, member of the Board of Control from Southern Oregon, attended the meeting of the Northwest Fruit Growers' Council in August, where he also met Mr. Brand and members of the Federal Trade Commission, composed of Jos. E. Davies of Wisconsin, chairman; Edward Hurley of Illinois, vice-chairman, and the following other commissioners: Wm. J. Harris of Georgia, Will H. Parry of Washington and George Rublee of New Hampshire. The Federal Trade Commission is making an extensive tour of the United States to ascertain just what trade conditions are and for the purpose of seeing what can be done to improve business conditions.

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PORTLAND, OREGON

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THE CHAS. H. LILLY CO., Seattle



The European apple market appears to be a very uncertain proposition for export this year on account of the war, the submarines and the blockades. Nevertheless the same conditions prevailed to some extent last year with a large export business being done, and larger in 1914 than in 1913, but it must be borne in mind that the submarines are more active, while the blockades are becoming more effective, with England endeavoring to prevent as much as possible shipments of many kinds going through the neutral countries into the countries at war with England and her allies.

A local representatives of an Eastern dealer is reported as having stated that the following is a list of apple prices that, in his opinion, can be expected to prevail at the beginning of the apple season: Arkansas Black, extra fancy, \$1.50, fancy \$1.30; Black Bens, \$1.25, \$1.05; Delicious, \$1.90, \$1.75; Jonathans, \$1.35, \$1.20; Yellow Newtowns, \$1.60, \$1.45; W. W. Pearmain, \$1.30, \$1.15; Rome Beauty, \$1.60, \$1.45; Spitzenberg, \$1.85, \$1.70; Stayman, \$1.40, \$1.25; Winesap, \$1.60, \$1.45; Ben Davis, \$1.06, 90 cents; Black Twigs, \$1.10, 90 cents; Grimes Golden, \$1.25, \$1.15; Bananas, \$2.25, \$2.10.

A shipment of Bartlett pears was condemned at Vancouver, B. C., on account of codling moth. A similar experience occurred last year. Therefore it seems wise to caution all fruit-shipping concerns to use extreme care in shipping to Canadian ports.

One apple grower of Wenatchee is reported as having sold his apple crop of Extra Fancy and Fancy, all sizes, as allowed in the Northwestern grading rules, at \$1.40 per box.

In the Hood River Valley there is the Apple Growers' Association organized in 1903, which will handle from two-thirds to three-quarters of the crop, the Northwestern Fruit Exchange, the Hood River Apple and Cold Storage Co. and a few independents.

The U. S. government reports 205,000,000 bushels of apples this year. Their report for last year indicated 253,000,000 bushels. The State of Washington is credited with 31,000,000 bushels.

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

The Second Manufacturers' and Land Products Show will be held in Portland October 25 to November 13. An unusually attractive program is offered this year, with special features for every day. This show is of special interest to the Northwest for the reason that the exhibits cover all the products of the soil and include all kinds of manufactured goods which are made in the Northwest. It is a splendid opportunity for all manufacturers to exhibit their manufactures and secure a great deal of publicity, and help secure additional business. It affords a splendid opportunity for the farmers to exhibit all products of the soil, which will certainly do much to encourage people to locate in the Northwest and help build up our agricultural communities where there is much land yet to be placed under cultivation, and which can be obtained at very reasonable prices. The managers of the Manufacturers' and Land Products Show show excellent judgment in making this a diversity show, because the future prosperity of the Northwest depends not upon the producing of one crop alone, but a large number of crops; in other words, "diversity farming."

The Northwest Apple Crop for 1915. While a great many estimators placed the apple crop of the Northwest at 12,000 cars, the Editor of "Better Fruit" early in the season estimated the crop around 9,000 cars. (At the time the Editor furnished this estimate he stated many things might arise between that time and harvesting to reduce the crop below that figure, more of which has happened than could reasonably be expected.) Since this estimate was made considerable damage has resulted in various districts from the following

causes: Hailstorms, codling moth, fungus, drouth, lack of water on the part of some of the irrigation companies,—all of which has changed conditions very much in the last thirty to sixty days. The consensus of opinion now seems to point to a much smaller yield than originally estimated. Consequently it looks very much as if the commercial crop would be as follows: Washington, about 4,500 cars; Oregon, about 1,500 cars; Idaho, 500 to 700 cars. There will be a reasonable proportion of Extra Fancies, but not as large in some districts as was anticipated early in the season, while in other districts the quantity of Extra Fancies will be larger than originally estimated.

Fall Spraying for Anthracnose.—Anthracnose is one of the most serious diseases that can infest an orchard, for the reason that when the trees become badly infested the large limbs die, and in a young orchard when the canker attacks the trunk of the tree the fruit grower may lose the whole tree. Recommendations for anthracnose is a fall spraying of bordeaux mixture. Of course the earlier this spray is applied in the fall the better. However, when there is a crop of apples on the trees the grower cannot use bordeaux strong enough to be absolutely effective in controlling anthracnose, therefore it is necessary to spray with bordeaux mixture, winter strength. This should be done immediately after the apples are harvested. Where anthracnose is more or less prevalent in an orchard it is recommended by pathologists that bordeaux of summer strength should be applied to the trees before the fall rains start in, which can be done without injury to the fruit. Every grower who has an orchard infested with anthracnose should spray this fall with bordeaux immediately after the harvesting season.

The United States Department of Labor has sent Inspector R. P. Bonham to Hood River to assist the fruit growers in securing help during the harvesting season. Splendid work was rendered this valley by the United States Department of Labor during the strawberry season. Mr. Bonham's work during the apple harvesting season is to assist growers to secure the necessary amount of competent help. The United States Department of Labor, Immigration Service, maintains an office in Portland, 424 Railway Exchange Building.

The Eighth National Apple Show will be held in Spokane November 15 to 20. Everyone who has attended the National Apple Shows at Spokane realizes fully their importance and value to the fruit industry of the Northwest. The people of Spokane are showing great enterprise in programming this show this year, especially so because it has been difficult to finance anything on account of the tightness of the money market. One of the main features of the show will be the meeting of the

Washington State Horticultural Society, which will hold its sessions in Spokane during the week of the Apple Show, under date of November 18 and 19. "Next Year's Marketing Problem" is one of the vital subjects that will come up before the growers who attend the Apple Show this year. Every fruit grower who can send an exhibit to this show should do so, and every fruit grower should attend. The National Apple Show has always been good and is entitled to the support of every fruit grower of the Northwest.

Marketing the 1915 Apple Crop.—The experience in marketing apples in past seasons, especially in 1914, when the crop was rushed on the market in bulk at harvesting season, realizing the lowest prices that have been obtained for box apples in many years, ought to be a good lesson to apple growers for 1915 and future years, indicating the necessity and importance of avoiding glutting the market at any particular time, especially in harvesting season. The supply of apples should go to the consuming public regularly month by month in ample quantities, without overcrowding the market during any of the marketing months. Of course this means that a great many apples should be placed in cold storage, and it is well in using cold storage to distribute the crop so that the supply is within close distance of the large consuming centers and tributary territory.

Fall Spraying.—Generally throughout the Northwest orchards have been pretty free from San Jose scale, consequently growers have not been spraying for San Jose scale in the last year or two, therefore San Jose scale has increased very considerably in various fruit districts throughout the Northwest recently. In some cases the scale is reported as being very plentiful. Growers are beginning to realize this, but a word of advice seems well worth while to those who may not be aware how serious this pest is if allowed to continue, as San Jose scale breeds very rapidly and only a small number this season may mean a seriously infested orchard next year. Therefore it is advisable to suggest that where scale is present in the orchard the fruit grower should spray either this fall or next spring. Of course if a man has comparatively little scale he can get along with one spray.

A New Grafting Wax.—Mr. August Niehans, after a long period of experimental work, has succeeded in making a grafting wax which is being reported on favorably by growers who have used it, especially on account of its convenience, as every fruit grower knows all grafting wax generally has to be heated and kept warm when being used. Mr. Niehans is making a pliable grafting wax that can be applied without being heated. Therefore it will be found to be a great convenience to the fruit grower who has grafting to do or who wants to cover the wounds after he has



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Portland, Oct. 25 - Nov. 13

we eat, and the more regularly we at it, the better health we will have. So anything you can do to boom National Apple Day will be a help to everybody.

Distribution of Northwestern Box Apples.—The Office of Markets and Rural Organization has perfected arrangements for investigation and study of distribution of Northwestern box apples. An office was opened in Spokane September 23 in charge of Mr. J. C. Gilbert. The excellent work being done in the distribution of fruits by the Office of Markets and Rural Organization will be of wonderful benefit to the fruit growers of the Northwest.

Treat the Boys—Now's Your Chance
National Apple Day occurs Tuesday, October 19, and is now a permanent institution. It is the day of cheer and all are invited to join in its festivities.

There are many reasons why National Apple Day should be encouraged. First of all, apples are a valuable commercial commodity and aid towards the nation's wealth, when they are grown and distributed scientifically. Second, their health value is unquestioned. Even with the knock given the doctor by the old-time slogan, "An apple a day keeps the doctor away," the doctor has many good words to say of the medicinal value of the apple. The modern slogan, "Health's best way, eat apples every day," is a more pleasing truth. The phosphorus in the apple is considered a great aid to brain workers, particularly if apples are eaten on retiring at night. From an economical standpoint a box or a barrel of nice juicy apples will satisfy and please more persons than any other article of food or luxury with which you can entertain them. From the humblest of humanity to the millionaire, king or queen, the apple will be accepted from the barrel or box without the use of a golden or silver platter, and such is the dignity of the apple, "King of Fruits."

So many good things can be said of the virtues of the apple, why not keep a nice box of apples near your desk, and your cigar bill will be less? Even the other fellow who is accustomed to the use of strong drink will change, when weaned to the liberal use of apples. Prohibitionist and temperance organizations should emblazon on their temperance banners, "Don't drink, pray; eat apples every day."

Accordingly you see apples are also a moral force. I might call them "The sunshine fruit of cheer." The smiling school children are aided in health by apples—but do they get their share? The man or men who supply their neighborhood schools with apples on National Apple Day will be blessed and revered with the joy of giving and the pleasure that is experienced by making so many others happy. Won't you help make the day a success by supplying your employes, family, friends, etc.? Nature's best fruit—the sunshine fruit of cheer. Beneficially and respectfully yours, R. J. Coyne, Chairman Publicity Committee.

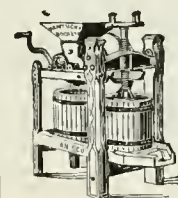
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Three Sizes
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done a severe pruning, to protect them from the weather. Attention is called to this wax on account of its convenient form, being ready for use at any time, which will save the fruit grower much trouble. Full particulars can be obtained by writing Mr. August Niehans, of Hood River, Oregon.

National Apple Day.—October 19th is National Apple Day. Every grower, every dealer, every retailer and everyone connected with the apple business should get behind this day to make it a grand success. It comes just as the right time of year when if the right effort is made a prompt stimulation can be created for apples which will mean increased consumption of apples during the year, and increased consumption of apples will mean a better demand and better prices, thus helping all the growers. On the other hand, the more fruit

Arthur M. Geary, whose father, Dr. Geary, owns a large orchard in Southern Oregon, while attending the law school in New York, was a frequent visitor among the fruit dealers of that city. He became impressed with the value of the auction market for apple growers. Since his return to Portland, where he soon expects to take up the practice of law, he has been visiting a number of fruit sections, explaining his views as to the value of auction markets to the apple growers by giving addresses and writing a number of articles which have appeared in various publications.

The Georgia peach section shipped about 1,500 cars of peaches to New York. In 1912 New York used about 2,600 cars of Georgia peaches and in 1914 about 1,600 cars. The Georgia peach crop varies all the way from about 4,000 cars annually to 8,000.



JAMES HANDLEY, QUINCY, ILLINOIS
Founder of National Apple Day

MR. HANDLEY was born in Rhode Island, spending much of his early life in an apple orchard, consisting of Rhode Island Greenings. When a boy he moved to Missouri, living for a few years in the vicinity of St. Joseph, where he continued his interest in orcharding and fruit growing, becoming a member of the local horticultural society. During his school life he devoted much attention to the study of botany, studying the growth of trees, plants and flowers. Afterwards he moved to Montana. While there he learned the printer's trade, becoming associated with the press and doing much work in a publicity way in developing the fruit industry of that state. While in Montana he published a pamphlet on the resources of that state, making prominent the orchard industry. Later he returned East and settled in Quincy, Illinois, his present home, where he assisted in organizing the Mississippi Valley Apple Growers' Association. For fourteen years he has been secretary-treasurer, a great tribute to his ability and sincerity in behalf of the fruit industry of that section. The association came into existence for educational purposes and for the purpose of observing more closely the causes of failures in the production of fruit. Through the efforts of Mr. Handley,

who conducted a very careful campaign of research work, it was determined to a large extent that the poor crops were due to a lack of care and treatment on the part of the owner. Therefore Mr. Handley concluded that it was wise to set apart one day of the year to be observed in giving serious attention to the causes of failure and to other factors that might be introduced for the purpose of arousing a more general and concerted action on the part of the growers, with a view to obtaining better results. Incidentally, confidence was inspired, and the idea was so popular that Mr. Handley conceived a second idea in connection with Apple Day, which was that such a day could be utilized by a feast of apples, in this way stimulating in the beginning of the apple season an increased desire which would lead to a greater consumption, that would be of benefit to the consuming public as well as the grower and everyone connected with the apple industry. The objects and aims of Mr. Handley were entirely original and so interesting, and the opportunity for accomplishing much along this line were so great, that the plans were approved by all of the prominent people connected with horticulture in the United States. The grower, the commission man, the apple dealer, the retailer, the

public, the press, have all worked admirably and forcefully together in harmony along the ideas of National Apple Day as suggested by Mr. Handley, and the results already achieved have far surpassed the most sanguine expectations. The orchard industry has advanced and improved during the last few years and has now become a permanent business, almost a stabilized business. National Apple Day by general agreement has been set for the third Tuesday of every October. In nearly all of the large cities this day is being celebrated throughout the Union with exhibitions of apples in all the leading stores; special inducements to the trade are offered; the day is observed by all the hotels, dining cars, restaurants, who prepare special apple menus for this great day, the greatest day in the whole year for the apple world, and in this way, just in the beginning of the harvesting season, the public is stimulated to a greater consumption, which is being maintained throughout the season. The press is liberal in its publicity work; everyone connected with the apple industry is enthusiastic over Apple Day, therefore all honor is due Mr. Handley for creating and establishing National Apple Day throughout the United States. The consumption of apples has increased far beyond calculations and National Apple Day has fulfilled, is fulfilling and will continue to fulfill its purpose by creating a greater consumption and a greater demand, which means more money for every one connected with the apple industry and better health for everyone, as there is no more wholesome food or diet than an apple.

SAND

An illustration on page 6 shows the best way for orchardists to overcome the difficulties of cultivating this soil.

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Consignments and Correspondence Solicited

Apples for the Soldiers in the Trenches

Every soldier in the trenches and hospitals in Europe will be given an apple in the near future, if plans now being worked out by a committee of the apple trade throughout the United States are successful. It is proposed to have a vessel take over a big cargo of apples to be distributed free under the auspices of the Red Cross, and efforts will be made to get President Wilson and Secretary of State Lansing to have the several warring governments permit safe passage for portions of the big consignment to the various fronts and hospitals where the fruit can be placed in the hands of the Red Cross for distribution, especially among the sick and wounded.

Apple growers and dealers who are endeavoring to send over the big consignment have learned that many of the fighting men are suffering because of lack of fruit juices, giving rise to scurvy and other disorders. Returning surgeons who have seen service in the European hospitals are said to approve heartily the plan to provide more fruit juices, not only among the wounded but also for the men in the trenches. "We are working on this undertaking purely from humanitarian motives," said one of the committee, who is a leading wholesale apple distributor, today. "It is going to cost a lot of money for the fruit alone, and we shall call upon all the people engaged in the apple industry to contribute a portion of the expense. At first the trade did not take kindly to the plan, as it was feared that vessels could not be found to carry over the apples. Then the idea was conceived of chartering a ship which would take nothing but apples, and we believe that when the purpose is disclosed to foreign governments none will oppose free passage of our ship, for it will go on a mission of charity. Last year they let several cargoes of toys and other similar articles go through to the different countries, and I think these apples ought to be considered in the same light as other gifts which America has donated to the war ridden countries."

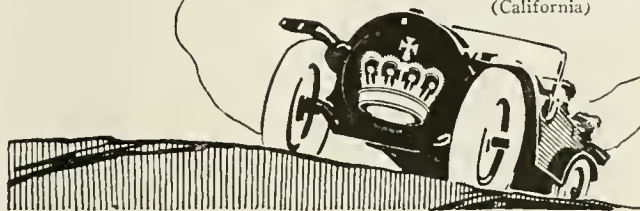
A local apple man who has interested himself in the matter, and who has figured out how it can be done, says: "It is a big proposition and will require skilful handling, but it can be done. The value of the fruit alone would approximate about \$300,000 aboard ship at New York, for apples are worth considerably more than a year ago. Of course the expense of outfitting a vessel is a matter that has not been fully decided upon, but the fruit people have always been charitably disposed in cases like this, and they will help to find the means if assurances are given that the apples will reach the proper hands. We understand that there are about 25,000,000 men actively engaged in the various armies and navies in the European war, and probably as many more indirectly involved. To give them all an American apple apiece would mean at least 50,000,000, and taking 500 apples to the barrel, which would be

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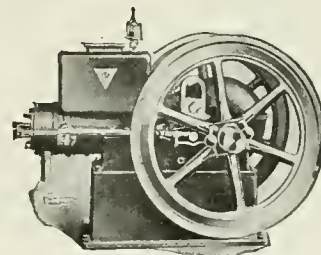


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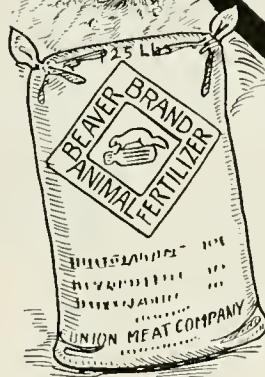
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Portland, Oregon.

medium size fruit, we shall have to provide 100,000 barrels or 300,000 boxes at the lowest estimate. At present the minimum market value of this fruit is \$3 a barrel. I figure the whole undertaking would cost not less than \$500,000, but when we stop to figure that every person in this country, no matter what his nationality may be, could easily lend a hand in the undertaking, it is not such a difficult proposition as one might suppose."

Apple men hope to have the European belligerents to agree upon a one-day armistice when the apples are distributed, and it is planned to get everything in readiness for the vessel to sail on National Apple Day, October 19, so that the consignment may reach the various fighting zones and hospitals the early part of November, when Europe's scant fruit supply will have been exhausted for this season.

APPLE SHIPPERS' COMMITTEE

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Warley Fruit & Produce Co., Mobile, Ala.
Scott Mayer Commission Co., Little Rock, Ark.
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L. M. Speigl, of A. Levy & J. Zentner Co., San Francisco, Cal.
A. S. Donaldson, of Donaldson Fruit Co., Denver, Colo.
E. M. Merriek, Washington, D. C.
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Crenshaw Bros. & Saffold, Tampa, Fla.
W. W. Anderson, of W. W. Anderson & Son, Atlanta, Ga.
E. L. Stanley, of E. L. Stanley Co., Columbus, Ga.
C. E. Newton, of C. E. Newton & Bros., Macon, Ga.
Nelson & Finch, Peoria, Ill.
R. V. Bahr, of Pure Ice & Cold Storage Co., Springfield, Ill.
R. H. Pennington, of R. H. Pennington & Co., Evansville, Ind.
J. H. King, of Vondersaar & Co., Indianapolis, Ind.
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O. West, of C. C. Taft & Co., Des Moines, Ia.
Wm. Hanson & Sons, Dubuque, Iowa.
Palmer Fruit Co., Sioux City, Iowa.
W. O. Anderson, Topeka, Kan.
T. C. Bayless, of Bayless Fruit Co., Lexington, Ky.
Charles Scholtz, of Denunzio Fruit Co., Louisville, Ky.
Charles Sugarman, of Kohlman Bros.-Sugarman, New Orleans, La.
U. Grant Border, of T. H. Evans Co., Baltimore, Md.
Cecil Cummings, of Sands, Furber & Co., Boston, Mass.
H. J. Perkins, of Henry Perkins Co., Springfield, Mass.
W. N. Gleason, of W. N. Gleason Co., Worcester, Mass.
John D. Wiley, of D. O. Wiley & Co., Detroit, Mich.
T. F. Mosely, of Mosely Bros., Grand Rapids, Mich.
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J. C. Famechon, of J. C. Famechon Co., Minneapolis, Minn.
C. Emerson, of C. Emerson & Co., St. Paul.
R. H. Jones, of Ginochio-Jones Fruit Co., Kansas City, Mo.
L. H. Hunt, of Hunt Bros. Fruit Co., St. Joseph, Mo.
George P. Schopp, of George P. Schopp & Co., St. Louis, Mo.
G. G. Trimble, of Trimble Bros., Omaha.
C. Wollers, of C. Wollers Co., Newark, N. J.
F. Brennisen, of F. Brennisen Son, Buffalo.
Joseph Steinhart, of Steinhart-Kelly, New York.
G. E. Ward, of G. E. Ward & Co., Ravena, N. Y.
H. B. Cash, of E. M. Upton Cold Storage Co., Rochester, N. Y.
The Athens Ice & Storage Co., Athens, Ohio.
J. Castellini, Cincinnati, Ohio.
Geo. Myers, of Myers, Weil & Co., Cleveland.
L. K. Sutton, of Sutton Bros., Columbus, O.
M. O. Baker, of M. O. Baker & Co., Toledo, O.

R. B. Clayberger, of C. Wilkinson's Sons, Philadelphia.
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 W. H. Fiske, of H. B. Fiske & Co., Providence, R. I.
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 I. T. Hertzka, Nashville, Tenn.
 A. A. Jackson & Co., Dallas, Tex.
 C. E. Harkrider, of Harkrider-Keith-Cooke Co., Fort Worth, Tex.
 Eugene Robinson, of Richmond Cold Storage Co., Richmond, Va.
 E. H. Jennings, of Jennings Bros., Roanoke, Va.
 H. T. Lang Co., Eau Claire, Wis.
 Fred Grossenback, of A. Grossenback, Milwaukee, Wis.

A plant to exploit apples is being arranged by the trustees of the Spokane Fruit Growers Co. and a committee from the Chamber of Commerce of Spokane. The Chamber of Commerce believes that increased consumption and better prices can be obtained if the fruitgrowers of that section spend the necessary amount of money in publicity required for this purpose. That the Chamber of Commerce believes in publicity to advertise the apple is evidenced by the fact that they state they are ready to spend \$1,000 in an advertising campaign for this purpose. While no definite plan, in the latter part of August, had been effected, the matter was largely placed in the hands of Mr. Corbaley, secretary of the Chamber of Commerce, who is well known to the fruitgrowers of the Northwest, having been manager of the National Apple Show at Spokane during the last two years. Mr. Corbaley is credited with being one of the ablest and most popular publicity men in the Northwest.

Arthur M. Geary states that in Boston Northwestern apples are sold by the wagonload, containing various varieties, sizes and grades. This information will not be very gratifying to Northwest apple growers because they have ascertained by experience that job-lot cars do not bring good prices. Therefore it cannot be expected that jobbing by the wagonload, in job lots of sizes and grades, will bring good prices. When a retailer or wholesaler has to purchase a job lot containing a lot of stuff that he does not want in order to get some that he does want, the average price cannot help but be low. There has been a strong demand on the part of dealers to buy in straight carloads of single varieties of certain grades with size specifications. Such carloads certainly bring the best money, and inasmuch as fruitgrowers, through marketing associations, have learned that the job-lot tramp grades sell at very low prices, it seems that they should wake up and load their cars in the way the trade demands and in the way that will bring the most money.

Following is a list of shippers reported approved by the Growers' Council as announced by W. H. Paulhamus: Hays Fruit Co., North Yakima; Randolph Fruit Co., North Yakima; The Fruit Exchange, Kennewick;

Our Special Clubbing Offer

"Better Fruit" offers to its readers a splendid clubbing list. These rates do not apply to Canada, owing to extra postage.

Through lack of space we are unable to give a more extended clubbing list. If this clubbing list does not meet your requirements, please make up a clubbing list that you desire, send it to us and we will advise you what the list will cost you.

Everybody's	\$1.50	Hoard's Dairyman	\$1.00
Delineator	1.50	Review of Reviews	3.00
Better Fruit	1.00	Farm Journal (5 years)	1.00
		Better Fruit	1.00
Total	\$4.00	Total	\$6.00
All for	2.75	All for	3.70
Outlook	\$3.00	Ladies' World	\$1.00
Scribner's	3.00	Modern Priscilla	1.00
World's Work	3.00	Pictorial Review	1.00
Better Fruit	1.00	Better Fruit	1.00
Total	\$10.00	Total	\$4.00
All for	6.45	All for	2.75
Scribner's	\$3.00	American Swineherd .....	.50
Delineator	1.50	Everybody's	1.50
Everybody's	1.50	Oregon Agriculturist .....	.50
Better Fruit	1.00	Better Fruit	1.00
Total	\$7.00	Total	\$3.50
All for	4.50	All for	2.60
American Magazine	\$1.50	Fruit Grower and Farmer	\$1.00
Woman's Home Companion	1.50	Good Housekeeping	1.50
Better Fruit	1.00	Better Fruit	1.00
Total	\$4.00	Total	\$3.50
All for	2.15	All for	2.60
Woman's Home Companion	\$1.50	Northwest Poultry Journal .....	.50
American	1.50	Gleanings in Bee Culture	1.00
Better Fruit	1.00	Review of Reviews	3.00
Total	\$4.00	Better Fruit	1.00
All for	2.80	Total	\$5.50
Aeronautics	\$3.00	All for	3.40
Good Housekeeping	1.50	Pacific Homestead	\$1.00
Better Fruit	1.00	Delineator	1.50
Total	\$5.50	Better Fruit	1.00
All for	4.30	Total	\$3.50
Motion Picture Magazine	\$1.50	All for	2.60
American Boy	1.00	Western Farmer	\$1.00
Better Fruit	1.00	Harper's Bazaar	1.50
Total	\$3.50	Everybody's	1.50
All for	2.80	Better Fruit	1.00
Automobile Journal	\$1.50	Total	\$5.00
Scientific American	3.00	All for	3.75
Better Fruit	1.00		
Total	\$5.50		
All for	4.70		

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**Strawberries
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 give sure and quick
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Order early. Your inquiries will have prompt attention. It pays you to have your order on file when the shipping season begins.

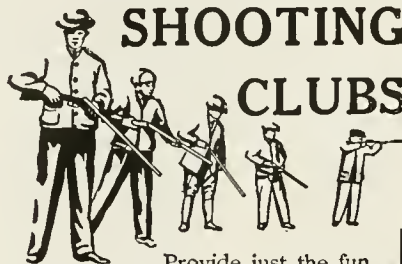
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are grown in Oregon**
 Sturdy, healthy stock with
 heavy, fibrous roots. Dug

and packed as ordered. Bearing
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Provide just the fun the farmer needs. Be sociable. Invite the neighbors to a trapshoot in the meadow. Find out who is the best shot. Meet once a week in winter—once a month in summer, and soon all will be good shots.



HAND TRAP

throws clay targets 40 to 75 yards just like flying ducks or quail.

Great practice for hunters. Fun for everybody. Let the women try. They ought to know how.

The Hand Trap costs only \$4.00 at your dealers, or sent prepaid by us. Write for free Hand Trap Booklet No. S-534, also "The Sport Alluring" (men) and "Diana of the Traps" (women).

DU PONT POWDER CO.

Established 1802

Wilmington, Del.

Richey & Gilbert Co., Toppenish; Thompson Fruit Co., North Yakima; The E. E. Samson Co., North Yakima; C. R. Paddock, North Yakima; Pike & Blood, North Yakima; Yakima Fruit Sellers, North Yakima; Richey & Gilbert, North Yakima; Horticultural Union, North Yakima; Hafener & Plath, North Yakima; Producers' and Consumers' Alliance, North Yakima; J. F. McCurdy, Wapato; H. H. Davis Co., Kennewick; Northwestern Fruit Exchange; North Pacific Fruit Distributors (which includes the Yakima Valley Fruit Growers' Association); A. F. Carpenter; J. McPhee Ferguson; J. E. Shannon; Wright Fruit Co.; Fruit Growers' Exchange, Selah; Roy C. Brown, Zillah.

There is some talk about W. H. Paulhamus running for governor, but Mr. Paulhamus has not yet expressed himself definitely so far as has been ascertained. It is generally conceded and admitted that Paulhamus is not only a very able man and that he would make an excellent governor, but the fruit-growers believe that he has a greater opportunity to do more good by devoting his time to the berry business of Puyallup, which he has built up extensively and successfully. Fruitgrowers all over the Northwest are also putting up a strong claim for his services, believing that he can be of more value to the Northwest as a member and president of the Fruit Growers' Council than in any other position.

The Apple Show at the International Apple Shippers' Association at Chicago was a winner, both in quality and quantity. At the convention in Boston in 1914 the exhibit consisted of 1,100 plates, but this year the exhibit at Chicago consisted of 2,500 plates. Exhibits were made from the Northwest by Wenatchee, Hood River, Payette, Idaho, and also Sebastopol, California. The latter section is well known in the trade on account of being the largest producing section of Gravensteins of any single district in America.

According to general reports, business in the United States has been showing material improvement. A map has been compiled showing every state in the Union, and the states where business is good are marked in white and other states where business is only moderate are shown slightly shaded in black, while where business is below normal or poor that state is marked all black. Many states show white and some states show black shading, while some show slightly black shading, whereas only two states are put down in black or reported "poor."

F. E. DeSelle, horticultural inspector from Yakima, accompanied by Dr. J. W. Hotson, pathologist, connected with the Experiment Station at Pullman, who is doing special work in Yakima Valley, made a visit to Hood River in the month of August. Mr. DeSelle is one of the most energetic inspectors located anywhere in the Northwest, with an extensive acquaintance among fruitgrowers all over, having been a regular attendant at all of the horticultural meetings and apple shows held in the Northwest.

Philadelphia fruit dealers attended the International Apple Shippers' Convention at Chicago in large numbers, being very enthusiastic in according the meeting a great success.

West Virginia reports the apple crop of excellent quality, there being about 40 per cent of last year.

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PORTLAND, OREGON

There seems to be something peculiar about the fruit business. Prices do not depend entirely upon quantity, but they are due largely to other conditions which are not always tangible. It is usually a fact that when early fruits like cherries, apricots, plums and peaches bring low prices, all other kinds of fruits later in the season, like pears and apples, sell also at low figures. When the demand is good at the beginning of the season, fruit selling at good prices, usually this condition prevails throughout the year.

Mr. D. J. Whitney, editor of The Orchard and Farm, a short time ago made a flying trip through the Northwest, visiting the editor of "Better Fruit" on his way. Mr. Whitney is one of the best informed editors of all the fruit publications on the Pacific Coast. Orchard and Farm is one of the best fruit publications, typographically, in the State of California, and ably edited by Mr. Whitney.

It is stated by local Wenatchee papers that E. Wagner & Sons have contracted about 300,000 boxes straight orchard run of apples at an average of \$1.00 per box for Australian and South American markets. These purchases in a large measure consist of the early and fall varieties.

Statement of the Ownership, Management, Circulation, Etc.

Required by the Act of August 24, 1912.

of "Better Fruit," Published Monthly at Hood River, Oregon for October, 1915

Note: This statement is to be made in duplicate, both copies to be delivered by the publisher to the postmaster, who will send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the post office.

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Name of Managing Editor, E. H. Shepard. Post office address, Hood River, Oregon.

Name of Business Manager, E. H. Shepard. Post office address, Hood River, Oregon.

Publisher, Better Fruit Publishing Company. E. H. Shepard, sole owner and publisher. Post office address, Hood River, Oregon.

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Average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the six months preceding the date shown above: (This information is required from daily newspapers only.)

E. H. SHEPARD, Editor and Publisher.

Sworn to and subscribed before me this 25th day of September, 1915.

(Seal)

ERNEST C. SMITH.

(My commission expires August 7, 1916.)

Notary Public for the State of Oregon.



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Ship Your Apples—

—to the LOS ANGELES market, the distributing center of the great Southwest.

The California apple crop is about 1,800 cars short this season, which makes Los Angeles an excellent market.

Our two warehouses equipped with all the modern improvements which practice has taught us to be the best — with our experienced warehousemen who KNOW and DO IT, offer you an unusual inducement to cold store with us the apples you ship to this market.

We are in a position to render you a service that will please you.

Direct railroad connections — rates reasonable — communicate with us now

The Spokane National Apple Show

By Robert S. Phillips, Spokane, Washington.

THE National Apple Show, which has been a feature at Spokane for seven years, will be held again this fall, the business men of Spokane having recently decided to guarantee whatever deficit may result. While none of the seven apple shows held thus far have come out even financially, the business interests of Spokane have chosen to consider only the broad question of assisting the Northwestern fruit industry, even though they know they must be prepared to pocket a tidy loss each year. The eighth annual show will be held November 15 to 20, probably in the spacious grounds beneath the joint overhead tracks of the O.-W. R. & N. Company and Chicago, Milwaukee and St. Paul. Robert H. Kipp, a

well-known apple man, has been appointed chairman of the board of trustees.

This year the growers' conference will be directed by the Washington State Horticultural Society, which will be in charge the first three days. The Northwest Fruit Growers' Council, of which W. H. Paulhamus is chairman, has called a conference of growers to be held November 18 and 19 at the apple show. Marketing problems, especially those connected with the handling of the 1916 crop, are announced to be the chief subject of this conference. The closing day's session will be devoted to by-products of the fruit industry.

"Next year's marketing problem is the most vitally important question before Northwestern apple growers," declares Gordon C. Corbaley, manager of the show. "The Northwest in 1916 will be called on to sell between 18,000 and 22,000 carloads of boxed apples, as against 9,000 cars this year. Our ability to cause the market to absorb an increase of more than 100 per cent depends upon the way we systematize distribution. At the apple show the growers will consider the facts gathered by the Northwest Fruit Growers' Council during the 1915 marketing season, and will appoint committees to work out details to permit final and definite action at the annual meeting of the Council in January. "The women's department of the show, which was a wonderful success last year, will be repeated on a greatly enlarged scale. Demonstrations of grade and pack by the inspectors of the principal Northwestern boxed-apple shippers will be features of the apple show. The demonstrations are an important educational feature. Prizes are to be offered the inspectors for the most instructive and educational exhibit from the standpoint of benefit to the growers. The inspectors will be invited to enter five-box exhibits of the red, the partly red and green varieties, packing the boxes so as to demonstrate the extremes permissible under the standard classifications and illustrate the sizes permissible. In this connection the inspectors will be asked to conduct half-hour question round tables each afternoon, when growers may inquire regarding the grades and packs illustrated. The grade and pack exhibits will supplement the packing school and contests which have been features of previous apple shows. To stimulate interest in an absolutely uniform system

YAKIMA FRUIT SELLERS

North Yakima, Washington

A Central Selling Agency for Yakima

EXCLUSIVE DISTRIBUTORS FOR

Yakima County Horticultural Union

Yakima Fruit Growers' Exchange

Richey & Gilbert Company

Our organizations handled 2,500 carloads of Yakima Fruit last season. Hundreds of growers have joined our movement and we already have under contract a much larger proportion of Yakima tonnage than ever before. Additional tonnage is coming to us daily. We have a large proportion of the fruit in the early districts — therefore we can load the early assorted cars—money-makers for the trade and the growers.

WRITE OR WIRE US IN SEASON

H. M. GILBERT, General Manager

FRED EBERLE, Asst. Manager

Only a Car of Apples

OR

Tricks of the Trade Exposed

(By C. C. P.)

Br-r-r-r-r-r-r-z!

Bunco Skinner, the Prond Produce Pirate, deftly lighting a monogrammed Turkish cigarette with his right, gracefully bent over to the buzzer, and with his carefully manicured left rang for a messenger boy.

A moment before, his private secretary, Miss Keys, had laid a thick swad of telegrams on his glistening mahogany desk.

"Ah, hah!" said B. S. (for thus shall we refer to the villain in the future) — "Ah, hah!" repeated B. S., as he inhaled a fragrant draught from his privately monogrammed cigarette — "Today I make a killing." - - -

The continuation of this exciting story will be furnished on request. WRITE FOR IT TODAY—it is great.

Produce Reporter Company

CHICAGO

of grade and pack for every Northwestern district the five-box awards will be made not only on the basis of the most perfect fruit, but on the skill with which the different styles of packing are illustrated. In scoring the judges will emphasize the ability with which the various packs are exemplified. While the by-products proposition has been at a standstill since the European war began, making it more profitable to sell fresh fruit, that condition seems now to be passing, and the by-products features of the apple show promise to make a live subject. This will be discussed in the conference November 20."

Land Show in Portland Opens Soon

October 25 will witness the opening in Portland of the second annual Manufacturers' and Land Products Show. The exposition will be in progress until midnight, November 13, and each day will offer a special feature, event or program in which some city, town or community of the Northwest will take part. The exhibition is intended to show the whole of the Northwest under one great roof. More than 75,000 square feet will be devoted to exhibit space, and Oregon, Washington and Idaho counties and communities have been invited to take part. The management of the exposition is this year giving free space to land products displays and a grand prize is to be given for the best county exhibit.

Portland's Chamber of Commerce presents the exposition, and the directors of the show have been named by the Industries and Manufacturers' and the Oregon Development Bureaus, two of the most important in the work of the organization. Exhibits from the field, forest, factory and stream will be arranged in an attractive manner, and visitors will be given a truthful presentation of the agricultural, industrial and horticultural greatness of the Northwest. The exposition is open to exhibitors from the entire Pacific Coast. The exposition in Portland comes at a time of the year when the state and county fairs are over and this assures an excellent display of exhibits of all kinds in the Oregon metropolis. Consumer and producer will meet at the exposition, new markets will have a wider knowledge of what the Northwest produces. It will also present in a truthful manner the exact opportunities for homeseekers. It is intended that the exposition will prove an ideal medium to advertise many commodities to demonstrate and prove beyond question of doubt that the Pacific Northwest has many possibilities as a great manufacturing and industrial center.

Leading manufacturers of the Northwest assert the industries of the country are becoming better known each year as a result of the activities of the managers of the various concerns to acquaint the people with the articles that are produced here. In no better way can the manufacturer show to advantage what he really makes than by a comprehensive exhibit at expositions like the Manufacturers' and Land Prod-

Mr. Planter!

DID YOU KNOW
THAT A

Genuine Vrooman Strain Franquette Walnut Tree

will come into bearing as early as three or four years after planting?

And that there are many instances of four and five-year-old trees (after planting) producing close to a bushel of nuts?

And that there are thirty-two (32) pounds to the bushel?

And that from 22c to 25c per pound is an average market?

And that Oregon soil and climate make for perfection in treegrowing?

And that every order is backed by 30 years' experience in growing, packing and shipping?

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Growers of high grade nursery stock, guaranteed true-to-name. Breeders and importers of purebred Big Type Poland-China Hogs. Service boars, bred gilts and weaning pigs for sale.

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ucts Show, where more than 20,000 people daily view the displays. Applications for space have been received from many concerns, and by September 1st the success of the second annual show was assured. More than 4,500 members of the Chamber of Commerce are taking a personal interest to make the exposition the greatest of its kind ever staged in the West. Industrial exhibits will be arranged in the Armory and a temporary structure covering more than a city block will be erected to house the soil products.

Special prizes will be awarded for apple and potato displays, and the best individual farm exhibit. The exhibit of apples at this year's show will be a feature. Announcement is made by the Land Products Committee of the exposition that more than two-thirds of the counties of Oregon will send exhibits to Portland, and after the holding of the State Fair there is a possibility of having a display of some kind from each of the thirty-five counties in the state, as well as from sections of Washington and Idaho, especially the Washington counties in the Columbia River watershed. The transportation lines are co-operating to make the exposition a success, and low fares for the round trip will prevail while the show is in progress.

The Mutual Creamery of Utah is reported having announced that they will purchase 20,000 cows for the State of Utah during the next twelve months. The dairy business is proving a profitable diversity line for the fruitgrowers. There are reasons for this. Orchards produce better when the nitrogen supply and humus content is maintained in the soil, which can be done by producing cover crops of clover, alfalfa or vetch, which in turn will furnish feed, according to the size of the orchard, sufficient to maintain good-sized dairy herds.

Philadelphia papers are reported as strong on the idea, "Direct from the grower to the consumer." That may be all right and undoubtedly is in a small way, but the Northwest will have a big job if the individual growers would tackle the problem—each one finding for himself consumers to purchase his crop. A few growers can do this in a small way in nearby markets, but when it comes to moving 15,000 carloads of apples which have to go under ice that is another problem. It will be a long day before the grower can do away with either the dealer or the retailer.

John B. Cancelmo of Philadelphia, Pennsylvania, one of the high-class fruit dealers of the United States and one of the most popular men in the trade, in a personal letter to the editor reports the International Apple Shippers' convention as being the greatest and most successful meeting ever held. Mr. Cancelmo is one of the largest handlers of boxed apples from the Northwest in Philadelphia.



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We will be pleased to show you trees, apple trees that have a heritage, a quality that should be considered by everyone who plants a tree. Our trees are grown in clean hillside virgin red shot soil with clay subsoil, producing the most vigorous root system. Our buds are selected from the best bearing healthy Hood River trees that make the Hood River apple famous throughout the world. Our trees will give you satisfactory results in vigor, fruit and quality. Ask for catalog. We guarantee our products. Apples, pears, peaches, apricots, almonds and walnuts. A complete line of the best varieties of all kinds of fruits.

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100 LBS NET 100 LBS NET 100 LBS NET 100 LBS NET 100 LBS NET

Buy at wholesale from Jones Cash Store

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100-Pound Sack Now for ...



Ball-Mason Fruit Jars Reduced

Very best quality.

PINTS, dozen50¢
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QUARTS, dozen55¢
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1/2 GALLONS, doz..80¢
Gross \$9.00

FRUIT JAR CAPS,
dozen.....20¢

Extra Heavy Rubbers,
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Harvest-time groceries and provisions of all kinds at reduced prices. Send for special grocery catalog. For instance—

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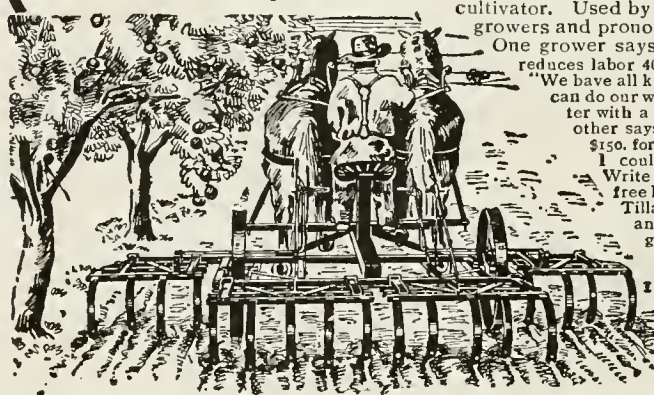
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Also Apples, Pears, Peaches, Plums, Apricots, Cherries, Small Fruit Plants, Etc.

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THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.

Let Us Help You Start A Profitable Business—

There is big money in making cider from cull fruit, windfalls and unmarketable fruit for fruit growers at a fixed price per gallon. Let us tell you how this is done on a "Mount Gilead" Hydraulic Cider Press. Our presses are helping thousands of men to a comfortable income and with a very small investment. Let us start you.

We manufacture Evaporators, Apple Butter Cookers, Vinegar Generators, Cider and Vinegar Filters, etc. Let us tell you about "Mount Gilead" outfits and how you can put good profits in your pocket by their use.

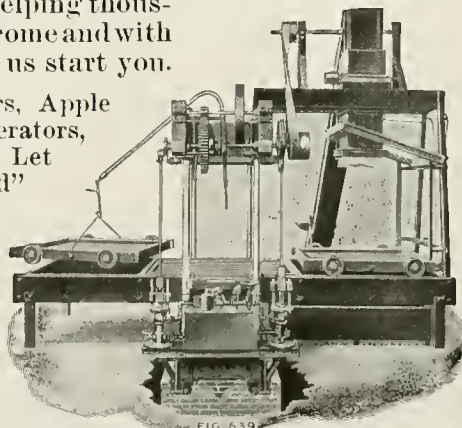
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Pacific Building, Seattle, Wash.



The Growers' League of Wenatchee has adopted a resolution which will require every packer to be registered. To register a packer must call at the office of the League and show references as to his ability and deposit a registration fee of \$1.00. Through this system the League believes it will be able to keep a line on poor packers and improve the Wenatchee apple pack very materially. Selling agencies and shippers operating in the Wenatchee district have promised their support to this system, which assures it of being a success.

The Libby, McNeil Cannery at The Dalles, Oregon, has done an extensive business this year. In addition to putting up an immense quantity of cherries from The Dalles, Hood River, Yakima and surrounding territory, they have put up a large amount of pears, buying 200 carloads from the Yakima district alone.

The Hood River Co-operative Creamery.—The fruitgrowers of Hood River several months ago organized and have been operating successfully a co-operative creamery which has proven very profitable to the fruitgrowers and a very satisfactory side line in connection with growing fruit.

Southern Oregon apple crop and pear crop are reported very light this year on account of frosts and exceedingly dry weather. It is stated by some who have visited this district that the shipments in pears and apples will probably be around 300 carloads.

J. D. Adams, member of the Growers' League of Wenatchee, attended the International Apple Shippers' convention at Chicago and is reported as feeling optimistic about the prospect of good prices on apples in the year 1915.

It is reported that Fred Olds of the Wenatchee district has contracted his apple crop, consisting principally of King Davids and Jonathans, damaged considerably by hail, at \$1.00 per box.

G. W. Coburn of Wenatchee Fruit Growers' Association and J. F. Segrue of the Cashmere Union attended the International Apple Shippers' Convention in Chicago in August.

The New York Central Railway officials report in 1914 they shipped out of Western New York 26,639 cars of apples.

Sumner, Washington, cannery processed a quantity of cherries this year for the first time on the maraschino method.

The ten-year-average apple crop, according to the United States government report is 176,000,000 bushels per year.

The Ozark peach crop is reported to have amounted to one-half million dollars this season.

The Apple Crop of the U. S. for 1914 and 1915

In 1914 the Agricultural Optimist reported the apple crop of the United States as 40,500,000 barrels. The opinion was frequently and generally expressed by the trade that the apple crop of 1914 was somewhere from 50,000,000 to 60,000,000 barrels. Striking an average between the Agricultural Optimist estimate and the dealers' minimum of 50,000,000 barrels would mean the crop was approximately 45,000,000 barrels. If anyone would take the various estimates that have been reported through the trade fruit journals and through various other sources and strike an average of the percentages, figuring out the total accordingly, he would probably arrive at the conclusion that the apple crop of the United States for the year 1915 is approximately in the neighborhood of 50 per cent. In making your estimate, however, you must bear in mind that some of the small producing sections have very high percentages in the way of crops this year, while some of the large producing sections have 50 per cent or less. New York State, the largest apple state in the Union, is estimated at from 40 to 50 per cent; Pennsylvania and New England, somewhere near the same percentage. In the Middle West, in Missouri and Arkansas and some other states the crop is large compared with last year, but it seems fair to assume that 50 per cent would be approximately a fair percentage. Taking 50 per cent of last year's crop, founded on an average from the Agricultural Optimist and the trade estimate, would figure out a crop of about 22,500,000 barrels, which is the lowest crop reported in the last twenty years. The following is an approximate list of the apple crop from the year 1895 to date, which has been printed in many publications. While we cannot vouch for the correctness, in all probability it is approximately correct: 1895, 60,500,000 barrels; 1896, 69,000,000 barrels; 1897, 41,000,000 barrels; 1898, 28,500,000 barrels; 1899, 58,500,000 barrels; 1900, 57,000,000 barrels; 1901, 26,970,000

Notice to Orchardists

On page 6 there is a photograph of orchard cultivation that will interest all fruit growers.

Caught 51 Rats One Week

Trap resets itself; 22 inches high; will last for years; can't get out of order; weighs 7 pounds. Cheese is used, doing away with poisons. This trap does its work, never fails and is always ready for the next rat. When rats and mice pass device they die. Rats are disease carriers, also cause fires. Rat catcher sent prepaid on receipt of \$3.00; Mouse catcher, 10 inches high, \$1.00. Money back if not satisfied. One of these rat catchers should be in every school building.

H. D. SWARTS, INVENTOR AND MANUFACTURER

Universal Rat and Mouse Trap

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Fall rains won't interrupt the work if you have a Caterpillar Tractor. Its long, wide endless track doesn't pack moist ground as round wheels do—doesn't slip or mire in the soft places. Get a Caterpillar now and plow when horses and round-wheel tractors are idle. Use it 200 days a year instead of 75.

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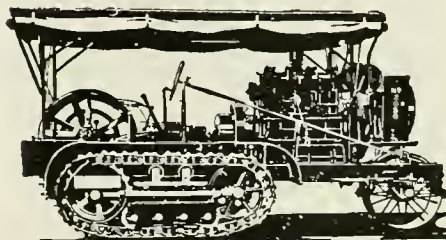
Don't say Caterpillar unless you mean Holt!

One owner farmed 1500 acres and earned \$10,000 outside in 15 months—only \$200 repairs.

It's being able to work every day in the year that makes the Caterpillar a money getter for you. And the upkeep cost is low—particularly in the new models.

The Caterpillar today is much stronger and simpler than the old 1911 and 1912 models. 5 pieces in the track unit where it took 25 three years ago—stronger frame—all cut-steel gears in dust-proof cases—scores of important refinements.

Send for new Bulletin BE 276.



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(EXTRA FANCY)

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Quality Brands of Yakima Apples

When ordering apples specify Blue Ribbon Brand and be assured of the best the market affords. All apples packed under our personal supervision and inspection.

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AND PRICES

Yakima County Horticultural Union

FRED EBERLE, Manager

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Are Made Hygienically Clean with Little Labor by

Large Sifter Can, with Full Directions, 10c

Old Dutch Cleanser

Chases Dirt

MAKES EVERYTHING "SPICK AND SPAN"


barrels; 1902, 46,625,000 barrels; 1903, 42,626,000 barrels; 1904, 45,360,000 barrels; 1905, 24,300,000 barrels; 1906, 38,280,000 barrels; 1907, 29,540,000 barrels; 1908, 25,850,000 barrels; 1909, 25,415,000 barrels; 1910, 23,825,000 barrels; 1911, 31,000,000 barrels; 1912, 47,825,000 barrels; 1913, 30,900,000 barrels; 1914, 40,500,000 barrels; 1915, no reliable estimates up to the present time, but in all probability somewhere between 20,000,000 and 25,000,000 barrels, or a good, fair guess would be 22,500,000 barrels.

Mr. Darlington, the local inspector at Cashmere, has been making an estimate of the apple crop of that district. Cashmere reports through Mr. Ralph Dunham, assistant to Mr. Darlington, that the pear crop of that district is exceptionally good this year. The Cashmere Union made arrangements to hold a packing school during the month of August for the purpose of instructing their growers to do more perfect packing. Packing schools have been of great educational value, and where held in the different districts the packs of different fruits have been greatly improved.

The apple crop of 1914, taking a fair average of estimates, would be about 45,000,000 barrels; the crop of 1913 was reported at 30,000,000 and the crop of 1915 looks like about 22,500,000 barrels, or one-half of the 1914 crop or three-quarters of the 1913 crop.

Market Expert Expresses Opinion

Chas. J. Brand, head of the Bureau of Markets and Rural Organizations, who has been visiting the West, is reported as expressing the following opinion, according to local papers in the various sections where he visited, conferring with the growers in reference to marketing, endeavoring to assist them in every way possible. His opinion outlines in a general way his views, which will give the growers some idea of where they "are at" in reference to the Fruit Growers' Council, although his opinion is not final or binding in any way. "There are some close questions to be considered," said Mr. Brand this morning, "and I think that I have been quoted incorrectly in some of the papers of the Northwest. I hold that any body of growers or stockholders in a concern may agree upon prices and marketing practices under the pro-



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The only complete, thorough manual of fruit growing published—covering every feature—planting, pruning, cultivating, spraying, diseases, harvesting, etc., as used and approved by Northwest fruit growers. Contains valuable statistics. All reading matter arranged conveniently for reference and indexed. It tells how to do the things that every fruit grower must do who is growing fruit as a business.

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POWER WASHER

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A REAL POWER WASHER

Round rubber rubs the clothes, turns them over and over and forces the hot, soapy water through them. Washes tub full perfectly clean in 5 minutes. No wringers to shift. Nothing to get out of order. Special low price to introduce. Catalogue Free.

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visions of the federal law. If the growers of this valley and Hood River and Wenatchee want to get into one growers' organization, as individual growers and not as members of another organization, I think that they have a perfect right to do so and will not in their operations come in conflict with the terms of the anti-trust act. As individual growers acting co-operatively they can control their marketing, but if they try to act as corporate units they are passing the limits of the law. Growers in this valley, Hood River and Wenatchee have not exceeded the limits of their rights under the anti-trust law by forming the Growers' Council, but they must join it as individuals and not by associations, such as the Fruit Growers' Association, the Horticultural Union and the like.

"When it comes to the question of the several associations affiliating for the purpose of control of markets I think the limits of the law are passed. When it comes to the Shippers' Council and Growers' Council attempting to co-operate in handling the marketing I am certain that this is in violation of the anti-trust law. I hope I make myself clear. A co-operative fruit organization, no matter how big, can act as the 2,500 stockholders of the steel corporation in the handling of their product. The limits of the law are passed when several of these co-operative organizations come together and attempt to control prices."

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Turns night into day. Gives better light than gas, electricity or 15 ordinary lamps at one-tenth the cost. For Homes, Stores, Halls, Churches. A child can carry it. Makes its light from common gasoline. No wick. No chimney. Absolutely SAFE.

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by giving him THE BOYS' MAGAZINE. You could not give him a greater pleasure or a stronger influence for good. Each issue of this splendid magazine is filled with clean, fascinating stories and instructive articles, all of intense interest to every live boy. Also, each issue contains departments devoted to Electricity, Mechanics, Athletics, Photography, Carpentry, Stamps and Coins. A new, handsome cover in colors each month. Beautifully illustrated throughout, both in black and white and in colors.

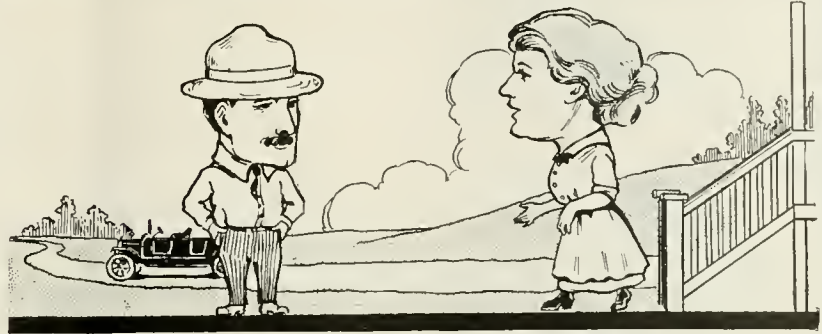
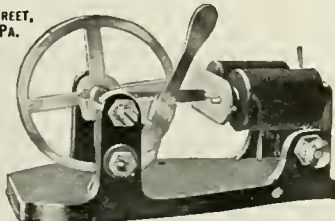
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And John "obeyed orders" cheerfully, for of all the members of the household, John, the "boss," likes his breakfast cup of Ghirardelli's the most.

He knows what a delicious, sustaining beverage it is, what wonderful cakes, puddings and cookies his wife makes with its aid. He also knows that it gives the highest food value for the man who works hard, for the woman who must always be well, for children on the grow.

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Ghirardelli's The Only Ground Chocolate

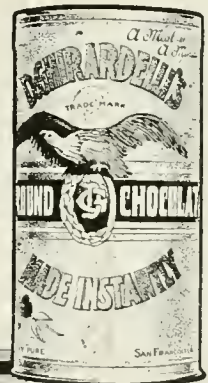
In ½-lb., 1-lb. and 3-lb. hermetically sealed cans. There's a double economy in buying the 3-lb. can.

D. GHIRARDELLI CO.

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You are invited to visit the Ghirardelli Pavilion at the Panama-Pacific International Exposition and see a model chocolate factory in operation



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Established 1900

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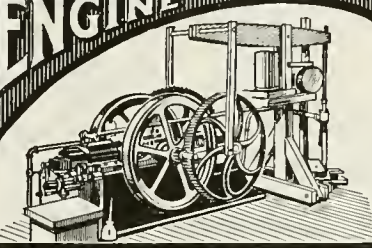
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WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

Read my Book- See my Prices- Before you buy any ENGINE



This WITTE Engine, after 28 years, still giving good service to S. A. Stone, Chillicothe, Mo.

WITTE ENGINES

Kerosene, Gasoline & Gas

You can now own a good Engine for less than you can do without one.

LOOK AT THESE PRICES!

2 H-P. \$34.95; 4 H-P. \$69.75; 6 H-P. \$97.75;
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White River Flour

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Whiter, Lighter
Bread

A New Discovery in the American Wine Industry

The American Department of Agriculture announces that there has been discovered at Washington a method for concentrating grape juice which promises to be the greatest discovery in the wine industry since Pasteur discovered the method of preserving light wines for the French government.

This new method is altogether novel, as it consists not in boiling down the juice, but in freezing the juice. The ice is then cracked into small pieces and whirled in a centrifugal machine; by this means all the sugar and thick syrup is separated from the ice, which is almost pure water. By this means a gallon of the syrup is reduced to one quart.

A peculiar phenomenon incident to this process is the fact that the cream of tartar crystallizes out with the ice and makes the acidity of the juice much less than normal. This is particularly true of the Concord grape juice, which has a large percentage of tartar in it.

This new method of freezing the juices to concentrate them preserves in a wonderful degree the natural purple color of the juice and makes the drink very much more beautiful in its rich purple appearance and more sparkling.

When the concentrated juice is sterilized afterward by heating it keeps indefinitely as a thick syrup. It can be used at soda fountains, as flavorings for cookery and other dietary purposes. The government hopes to exploit this latest discovery on a commercial basis this year, as it promises not only to give a fine quality of goods from the best grapes, but also the freezing method takes out the "rough" taste of many cheaper grades and gives a very fine article from the cheaper and coarser varieties.—Scientific American.

A Few Canning Hints

Have the canning plant properly installed before the fruits and vegetables begin to ripen. See that the cans, labels, cases, solder, flux, etc., are ordered immediately. Be sure to order the hole and cap cans, and specify in your order that you want solder-hemmed caps. Order the enamel cans for fruits if you wish to preserve the color, flavor and quality of the product. The soldering irons should be properly tinned if you wish to do a smooth job of soldering. This is done by heating the irons, then filing them until they are bright. The irons are now dipped in a zinc solution, then rubbed in sal-ammoniac to which solder has been added. When the cans are placed in the retorts keep up the pressure as recommended, and do not record the time until the thermometer registers the degree of heat recommended for handling the various products. For detailed instructions write for the Canning Bulletin, No. 82, Idaho Experiment Station, Moscow, Idaho.—C. C. Vincent, Horticulturist.

Let 'er Rain!

If you've a man's work to do, wear Tower's Fish Brand



**Reflex
Slicker
\$3.00**

The coat that keeps out all the rain. Reflex Edges stop every drop from running in at the front.

Protector Hat, 75 cents

Satisfaction Guaranteed

Send for free catalog

A.J. TOWER CO.
615 BOSTON



Harvey Racine Bolster Springs

The standard springs of America since 1889. Made any wagon a spring wagon. Prevent damage to eggs, fruit, etc., on road to market. Soon save cost—produce brings more—wagon lasts longer—easier for driver—easier for horses.

Made Like Finest Auto Springs

Highest grade steel. Very resilient and durable. All sizes—fit any wagon up to 5 tons capacity. If not at dealer's, write for circular showing how Harvey Springs save money.

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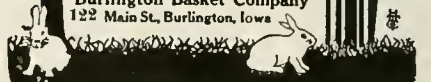
DON'T take chances with your young trees. One rabbit will kill many in a single night. Mice and cut worms will damage and destroy them if you don't protect them. Get dollars' worth of protection at a fraction of a cent cost by using

Hawkeye Tree Protectors

Absolute protection against gnawers and borers. Prevent trees from becoming skinned and bruised by cultivator or lawn mower. Made of elm veneer, chemically treated. Easily put on and will last until tree is beyond needing protection. Don't wait until some of your trees are killed—order Hawkeye Protectors now. Regular size 10 inches wide, 20 inches high. Price in lots of 100—1 cent apiece, in lots of 1000—1/2 cent apiece. Special sizes made to order. Write for circular and samples.

We make Fruit Baskets—get our prices.

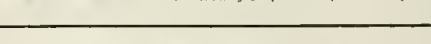
Burlington Basket Company
122 Main St., Burlington, Iowa



SEPARATORS, ENGINES, SPREADERS

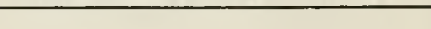
200,000 customers testify that my designers and factories build quality into them. Built for long, hard, continuous users' satisfaction. **HIGHEST QUALITY—LOWEST PRICES.** About 1-3 to 1-2 less than you usually pay. Don't buy till you get my catalog of these and other farm and household goods free. A postal card ok. Low freight rates.

Wm. Galloway Co., Bx 1055, Waterloo, Ia.



YOU CAN EARN \$50.00 PER DAY

with the Gearless Improved Standard Well Drilling Machine. Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2 1/2 gal. distillate at 9c per gal. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W.B. REIERSON MACHINERY CO., Manfrs., Portland, Ore.



Pear Blight

Mr. Waite, a graduate chemist and druggist, with many years' practical experience in compounding chemicals, states that he believes he has found the cure for blight, which is a chemical preparation which, when applied, kills the germs by dissolving the exudation. While it is hoped that his remedy will prove successful, fruitgrowers in general are not inclined to believe in any remedy for the cure of blight. In fact they will not believe that there is any method of controlling blight except the cutting-out process until such a remedy has been proven positively effective.

Mr. Anthonie van Diem, of the firm of W. van Diem Company of Rotterdam, Holland, called at "Better Fruit" office in July, this being his first trip to the United States. The firm of W. and W. U. van Diem was started in 1860, and imported Northwestern fruits as far back as 1895. Mr. van Diem left Holland on this trip on the steamship Rotterdam June 12, 1915, the voyage taking twenty-one days. His experience was quite interesting. The steamship was held up several times by British and German boats, but after leaving the Irish coast he had a very pleasant trip. Mr. van Diem was very much impressed with the City of New York, which he saw for the first time. He arrived in Portland July 18th, being entertained in that city by Vice-Consul of the Netherlands, Mr. Berghuis-Krak and his friends. On July 22nd he came to Hood River, calling on the editor of "Better Fruit," in which paper the firm has advertised for a number of years. He was also entertained by Mr. Wilmer Sieg, sales manager of the Hood River

Lime Sulphur Lead Arsenate Bordeaux Paste Spra-Sulphur

The most serious pests and diseases doing the most damage to trees in the Northwest are San Jose Scale and Anthracnose. The ones doing the most damage to crops and causing a loss of millions annually to fruit growers, are Codling Moth and Seab.

Growers Must Have Sprays that are Efficient

We make the above sprays of the highest degree of efficiency and sell at reasonable prices.

Clean crops are necessary if you expect to sell your apples at good prices.

Use Our Sprays and Grow Clean Fruit

Factory at Clackamas, Oregon.

New factory being built at Hood River, Oregon.

For the present direct all correspondence to

Oregon Arsenical Spray Co.
CLACKAMAS, OREGON

What are your dairy problems?

To get started profitably in dairying as a side-line, the fruit grower needs helpful advice and suggestions.

Our service department will delight in doing this very thing, without any charge or obligation.

We are sole Oregon distributors for "Simplex" Separators, B-L-K Milkers, Papec Ensilage Cutters, Simplex Silos and all kinds of dairy, butter-making and cheese-making supplies.

Your name on a postal will bring Free Catalogs

Monroe & Crisell

126 Front St. Portland, Oregon



Pacific Coast Agents
**United States Steel
Products Co.**

San Francisco
Los Angeles
Portland
Seattle



J.C. Pearson Co., Inc
Sole Manufacturers

Old South Bldg.
Boston,
Mass.

PEARSON
ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.
ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.
RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.
SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.
ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.
N A I L S



Make Your Old Trees Bear

Why let the old trees go to rack and ruin. Make them produce. Make them pay renewed interest on your past investment. Regenerate those old orchards and make the old trees bear.



**Red Cross
Dynamite**

will help you. By blasting and breaking up the subsoil around the trees, a new water reservoir is created, new plant food is made available and the old trees will be made to produce as well as before.

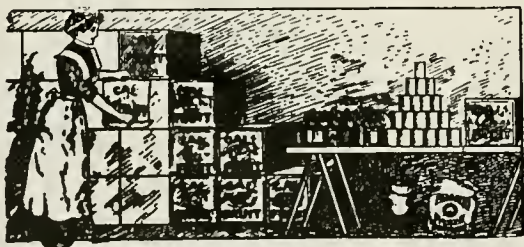
To learn how progressive orchardists and farmers are using dynamite for cultivating fruit trees, regenerating barren soil, ditching, draining, stumping, removing rocks and boulders and scores of other things, write for our well written and illustrated booklet F-338.

Established
1802

Du Pont Powder Company

Wilmington
Delaware

Paste for Labeling—"Palo Alto" Paste Powder



added to cold water, instantly makes a beautiful, smooth, white paste. Ready for immediate use at a cost of 10 cents a gallon. No labor. No muss. No spoiled paste.

PASTE SPECIALISTS

Robinson Chemical Works

349-351 Eighth Street
San Francisco, California

More About Walnuts

Why raise wheat and oats on land suitable for walnuts when the returns scarcely justify the labor expended, with very little income on your investment?

Our 6 and 7-year-old grafted VROOMAN FRANQUETTES are bearing several times as much net income this season as our wheat and oats. What will the difference be when the trees are 12 to 15 years old? We would estimate 10 to 15 times as much.

Why raise grain and sell it on oversupplied foreign markets at a low price when we are importing 10,000,000 to 12,000,000 pounds of walnuts that are not nearly as good and sell for a lower price than those we can raise here at home?

Many owners of seedling orchards of bearing age this season have applied to us for capable men to top-graft their orchards. This must be done at great expense and loss of time. Don't make this mistake, as others are now paying for this experience. We helped to pay for it by working over 800 seedlings ourselves.

Come this month before the nuts drop and compare our orchard with seedling orchards.

Write for our booklet, "Walnut Growing," and prices on GRAFTED VROOMAN FRANQUETTE walnut trees.

FERD GRONER & McCLURE, Hillsboro, Oregon

Apple Growers' Association. He stated he was much impressed with the beauty of Hood River scenery and its up-to-date orchards. Another thing which he spoke of particularly was the immense cold-storage plant and facilities of the Hood River Apple Growers' Association. Mr. van Diem left Portland July 23rd, via Seattle, intending to visit a number of other points on his trip, among them Chicago, Buffalo and Niagara Falls, expecting to reach New York August 3rd and sail on that day for home. The object of Mr. van Diem's visit was to make arrangements for such apples as his firm would require during the coming season and to form a more intimate acquaintance with the shippers of the Northwest with whom he has done business for many years, and with whom he expects to do a larger business in the future.

The peach crop of the Northwest in the year 1915 is reported about normal. Peaches in the Northwest have been packed exclusively in boxes, but in various other sections of the United States many other kinds of packages have been used for years, among which may be mentioned the bushel basket, the half-bushel basket, the six and four-basket crate, the Climax basket, containing one-fifth bushel; also one-sixth of a bushel and a twenty-pound package containing about one-third of a bushel. In Delaware and New Jersey the half-bushel basket is used quite extensively. The six-basket crate is more extensively used in the Middle West. Along the Atlantic Coast and in the Southern peach sections, as well as Virginia, the package used contains six baskets holding four quarts each. In California peaches are usually packed

HONEST TREES AT HONEST PRICES

Order your trees direct from longest established, most reliable nursery in the West. Save money—avoid disappointment. 500 acres—50 years thoroughly reliable dealings. Get our list and prices before you buy a tree : : :

THE
WOODBURN NURSERIES
Woodburn, Ore.

Store Your Apples in Spokane

The Natural Storage Center

Take advantage of storage in transit rate and the better market later. Write us for our dry and cold storage rate and information.

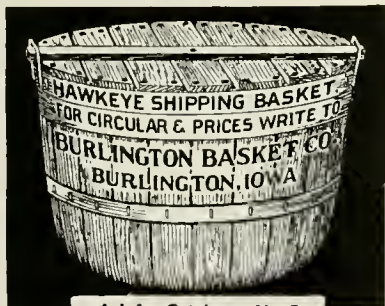
**Ryan & Newton
Company**

SPOKANE, WASHINGTON

in boxes containing twenty-one and one-half pounds. In Arkansas the six-basket crates are generally used; also in Georgia, Tennessee and Carolinas. Texas uses the four-basket crate most extensively. Michigan uses largely one-sixth, one-fifth and one-third Climax baskets, also bushels and short-bushel baskets, with a few of the half-bushel baskets. Ohio uses mostly the round bushel basket with very few other styles. Kansas ships usually in four-basket crates; West Virginia, Pennsylvania and Maryland use one-half bushel baskets and also six-basket carriers. It would look as if some step ought to be taken if possible for a more uniform package in marketing peaches, and that a federal law similar to the apple-barrel law would be desirable.

A North Yakima peach grower is experimenting with peach baskets this year which have been used almost exclusively in handling the peach crop in the East and Middle West. It is reported that he has ordered enough baskets to ship out eight or nine carloads. These baskets will weigh approximately 60 pounds and a carload will contain about 400 baskets. On account of the popularity of the basket in handling the peach crop it has been extensively used. While not posted on the prices of baskets it is reasonable to assume that inasmuch as they are used so extensively in the East that they are not only more economical in packing the crop but that this package is more attractive to the consumer and more convenient to handle.

It is reported that the North Pacific Fruit Distributors sold a carload of Lambert cherries to Steinhardt & Kelly which realized \$2,350 gross.

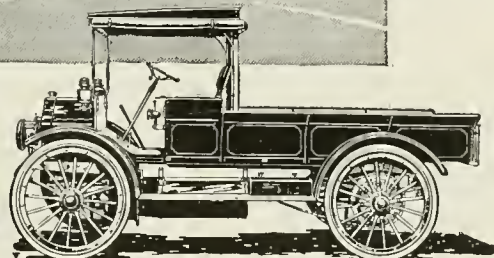


Ask for Catalogue No. 5

"The Farmers Friend"

In Handy Buckets Also Small Cans

Ask your Dealer



International Motor Trucks

THERE is one advantage in using an **International Motor Truck** that fruit growers and truck farmers are likely to lose sight of. The truck, traveling faster than horses, brings about one important economy.

Twenty to forty miles of daily travel, with the necessary stops, keep the horses and driver busy all day.

With an **International Motor Truck** the driver can start later in the morning and pass every horse-drawn rig on the road. He'll be back early and can put in the best part of the afternoon at productive work on the farm. That gain is enough to make a motor truck pay.

The driver's time on the road is an expense, his time on the farm a profit. An **International Motor Truck** saves you this expense and gives you this profit.

This is only one of many reasons why every fruit grower or truck farmer should use an **International Motor Truck**. Drop us a line and we'll send you more reasons and full information. One of our three trucks—a Model "M," for 1,000-lb. loads, a Model "E," for 1,500-lb. loads, or a Model "F," for 2,000-lb. loads—will fit into the conditions of your work. A post card to us may save you many dollars of expense. Send it today.

International Harvester Company of America

(INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
San Francisco, Cal. Spokane, Wash. Salt Lake City, Utah

D. Crossley & Sons

ESTABLISHED 1878

Apples for New York and Export

CALIFORNIA, OREGON, WASHINGTON, IDAHO AND
FLORIDA FRUITS

Apples handled in all European markets at private sale. Checks mailed from our New York office same day apples are sold on the other side. We are not agents; **WE ARE SELLERS.** We make a specialty of handling **APPLES, PEARS AND PRUNES** on the New York and foreign markets. Correspondence solicited.

200 to 204 Franklin Street, New York

NEW YORK

LIVERPOOL

LONDON

GLASGOW

Ridley, Houlding & Co.

COVENT GARDEN, LONDON

Points to remember when consigning
apples to the London Market

1.—We Specialize in Apples

2.—All Consignments Receive our
Personal Attention

3.—The Fruit is Sold by
Private Treaty

CABLE ADDRESS: BOTANIZING, LONDON

PORTLAND, OREGON

Portland Hotel

The hotel which made Portland, Oregon, famous
Most Desirably Located. In the Center of Shopping and Theatre District
Covers a City Block.

Broadway, Sixth, Morrison and Yamhill Streets
European Plan—\$1.00 per day and upward

Write for Portland Hotel Booklet.

GEO. C. OBER, Manager

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity
irrigation. Located 22 miles north of Spokane,
Washington, directly on the railroad. We plant
and give four years' care to every orchard tract
sold. \$125, first payment, secures 5 acres; \$250,
first payment, secures 10 acres; balance monthly.

SEND FOR BOOKLET

Arcadia Orchards Company

Deer Park, Washington

W. S. Ballard, plant pathologist, associated with the Department of Agriculture, has been making a visit in company with T. O. Morrison of the State Agricultural Department of Washington, inspecting the orchards in Yakima Valley. Dr. Brooks, associated in this campaign, is an expert on powdery mildew and other pathological diseases. Professor W. S. Ballard has an extensive acquaintance among fruitgrowers on the Pacific Coast as well as in the East, and is an expert on pear blight and many other diseases of fruit.

George Watts, an apple grower of Millersdale in the Wenatchee district, is reported as having sold his crop of 8,000 boxes, orchard run, at \$1.25 per box.

The Spokane Fruit Growers Co. reports that they shipped about 22,000 crates of strawberries, averaging the grower \$1.59 per crate.

Coming Events

Wilbur Fair, Wilbur, Washington, October 5 to 8.

Stevens County Livestock Show, Colville, Washington, October 26 to 29.

Arizona State Fair, Phoenix, Arizona, November 8 to 13.

Cascade International Stock Show, North Yakima, Washington, November 22 to 27.

Lewisston Livestock Show, Lewiston, Idaho, November 29 to December 4.

Pacific International Livestock Exposition, North Portland, Oregon, December 6 to 11.



FREE "Ask Pratt"

Here's a book of daily needs you should keep handy. It lists the best of every thing for the orchardist and truck grower. Standard spray materials, harrows, cultivators, graders, pickers, packing boxes, etc. If there's anything needed, "ask Pratt." You know him—he's the man who makes "Salecide—the tree saver." Everything else he sells is just as good.

Our Service Department

is under his direct supervision and he is always ready to advise, from his long experience, just what implement, spray material, etc., you need. Ask questions. But send for the book today.

B. G. PRATT COMPANY
Dept. D 80 Church St., New York

A NEW OPPORTUNITY IN THE WEST OKANOGAN IRRIGATION DISTRICT

9,400 acres bordering the Okanogan River will be irrigated with the completion of this project. This section combines the soil and climate of the most favored fruit growing districts of the state, with unusual opportunities for dairying and stock growing. A farm unit of 40 acres has been established and a price fixed on the excess acreage of land by the Board of Directors, which enables the homeseeker to purchase high class irrigated land at prices lower than prevailed twelve years ago in irrigated sections of Washington.

Send for our FREE publication with map and full description of country.

F. W. GRAHAM
Western Immigration
Agent
Great Northern Ry.
Seattle, Wash.



L.F.



The Inside Inn

is a beautiful, permanent, up-to-date hotel occupying a magnificent site within the grounds of the Panama-Pacific International Exposition, amidst the most wonderful setting of scenery and architectural beauty the world has ever known. The Inside Inn is but a short walk from the State and Foreign Buildings and practically surrounded by the main Exhibit Palaces.

Appointments throughout the hotel are first-class. Following are our general rates:

European plan, without bath, per day \$2, one person
European plan, without bath, per day \$3, two persons
European plan, with bath, per day, \$3 to \$5, one person
European plan, with bath, per day, \$4 to \$7, two persons

Our motor busses meet all trains and steamers.

We shall be glad to give you any general information in regard to the Exposition or side trips upon request.

ALBERT BETTENS, Manager

California

DIRECT ROUTE
TO

Portland

Ocean Liner or
Shasta Route Rail Service
TO

San Francisco

Steamship, Coast Line
or Orange Grove
Rail Trip
TO

San Diego

Liberal Stopover
Privileges

Diverse Routes Both Ways
if Desired

THIS YEAR has held more of interest, of wonder, of beauty, of pleasure, than ever before—possibly ever again.

THE WORLD-FAMOUS EXPOSITIONS

are now at their best. The opportunity to visit them is nearing its end—go now.

Information, tickets, reservations, etc., upon application to your local agent.

Write the GENERAL PASSENGER AGENT, Portland for your copy of

"California and the Expositions."

OREGON-WASHINGTON RAILROAD & NAVIGATION CO

UNION PACIFIC SYSTEM



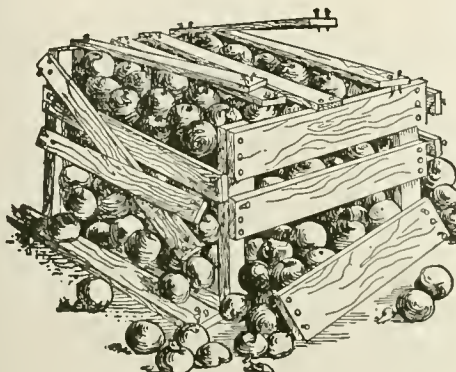
The First National Bank

Hood River, Oregon

Capital and Surplus
\$135,000

4% Interest Paid on Savings
and Term Deposits

F. S. STANLEY, President
E. O. BLANCHARD, Cashier



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

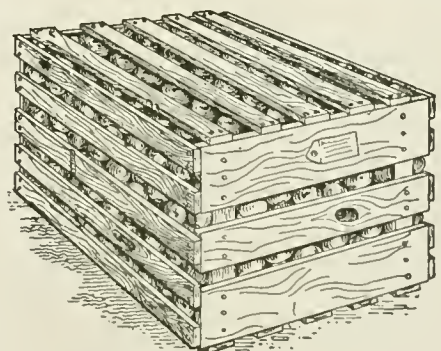
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles



AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

The World

Our Orchard

IN ALL FIELDS OF ENDEAVOR no work is more worthy of recognition than that of the salesman. To be successful these pioneers of commerce must possess attributes which would bring world wide recognition to men in other walks of life.

The salesmen of our country are largely responsible for the development of the great industries which are the bulwark of the nation. Most leaders of business were at one time salesmen; nearly every self-made man has served on the firing line of salesmanship. No house in the trade had humbler beginnings than the firm of

Steinhardt & Kelly

Built upon the fundamental principles of

Honor, Honesty, Strength and Service
which are the foundations of all successful business enterprises, the house of

Steinhardt & Kelly

stands today preeminent at the very top of the fruit industry of the United States.

Our Market

The World

BETTER FRUIT

VOLUME X

NOVEMBER, 1915

NUMBER 5



Five-box exhibit of apples packed by a nine-year-old daughter of the Editor of "Better Fruit," winning a first prize at the Oregon Horticultural Exhibit, and also at the Hood River Apple Show.

"Health's best way
Eat apples every day"

Buy them by the box

"An apple a day
Keeps the doctor away"

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

Subscription \$1.00 per Year in the United States; Canada and Foreign, Including Postage, \$1.50.

Single Copy 10 Cents

Prince Albert is such a real smoke

you can't any more sum up the pleasure it gives until you smoke some than you can tell how smart a man is from the size of his head. Takes a try-out to learn the *inside facts*!

You get that old pipe out of storage or locate some makin's papers, buy a supply of P. A.

and fire-up, for you can smoke like sixty—tender tongue or not—with nothing to think about but joy-joy-joy! The patented process fixes that, and *cuts out* bite and parch!

No matter how long you've sworn off the pipe line or shied on rolling your own cigarettes, you cut-loose like a man on what we tell you. Because, *we know* how good Prince Albert is; how much happiness it will hand you; how sincere will be your hearty, honest appreciation of its merits!

Prince Albert has revolutionized smoking-satisfaction for thousands of men! It has brought back countless pipes into the sunshine; *it will give you* more fun than you've had since those hickory-stick-school-days! Today, you lay in your supply of



YOU make fast tracks down the turnpike, for all stores sell Prince Albert in the toppy red bag, 5c; tidy red tin, 10c. Quick like you're set for the long pull, you'll want a bigger supply, so you'll find P. A. in handsome pound and half-pound tin humidors and in that mighty clever pound crystal-glass humidor with sponge-moistener top that keeps Prince Albert fit-like-a-high-top-thoroughbred!

R. J. REYNOLDS
TOBACCO CO.
Winston-Salem, N. C.

PRINCE the national joy smoke **ALBERT**

SIMONS, SHUTTLEWORTH & CO.

LIVERPOOL AND MANCHESTER

SIMONS, JACOBS & CO.
GLASGOW**GARCIA, JACOBS & CO.**
LONDON

Agencies and Representatives in Every Important European Market

European Receivers of American Fruits

FOR MARKET INFORMATION ADDRESS

Simons, Shuttleworth & French Co.
204 Franklin Street, New YorkSimons Fruit Co.
Toronto and MontrealSimons, Shuttleworth, Webbing Co.
46 Clinton Street, Boston

OUR SPECIALTIES ARE APPLES AND PEARS

**FOR QUALITY SALE**

See our "Ad" in the PACKER. We are selling to the trade all over the United States under this heading. Would you like some of your fruit placed on the same basis?

BOX APPLES

AUCTION, PRIVATE OR F. O. B.

We want to hear from every grower in your section who has fruit of quality

Ship Direct
One Commission**SGOBEL & DAY, New York**

The Old Reliable

BELL & CO.

Incorporated

WHOLESALE

Fruits and Produce

112-114 Front Street
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DRYER, BOLLAM & CO.GENERAL
COMMISSION MERCHANTS

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MERCHANTS

Wholesale Fruits

121-123 FRONT AND
200 WASHINGTON ST.

PORTLAND, OREGON

LEVY & SPIEGL

WHOLESALE

FRUITS AND PRODUCE

Commission Merchants

SOLICIT YOUR CONSIGNMENTS

Top Prices and Prompt Returns

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STORAGEShip your Furniture
to us to be stored
until you are located**TRANSFER & LIVERY CO.**
Hood River, Oregon**Orchardist
Supply House****Franz Hardware Co.**
HOOD RIVER, OREGON**Richey & Gilbert Co.**H. M. GILBERT, *President and Manager*

Growers and Shippers of

**YAKIMA VALLEY FRUITS
AND PRODUCE**Specialties: Apples, Peaches,
Pears and Cantaloupes

TOPPENISH, WASHINGTON

Established 1893

W.P. KRANER & CO.

Importers and Tailors

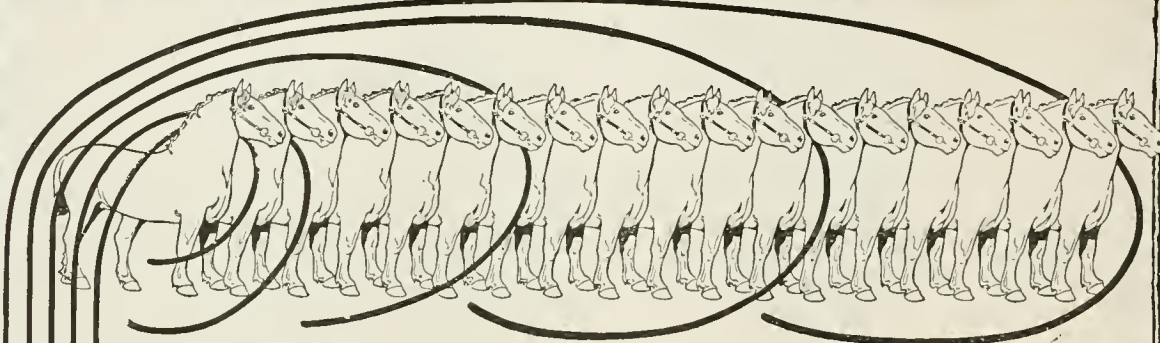
2nd Floor Couch Bldg.

109 Fourth Street

Portland, Ore.

Geo. E. Kramer

C. W. Stose



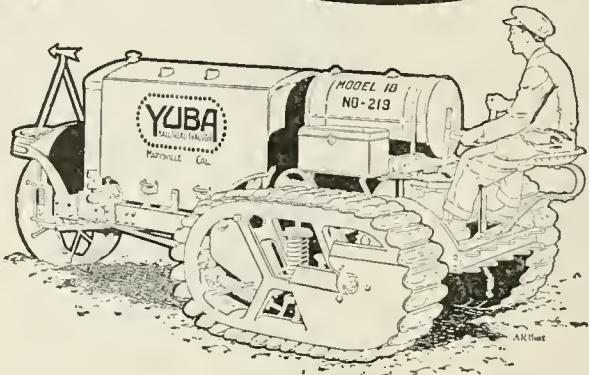
As easy to drive as 1 Horse

The size of 2 Horses

The weight of 6 Horses

The cost of 12 Horses

The power of 18 Horses



THE YUBA BALL TREAD TRACTOR

is comparable to horses in weight, size, cost and power. If you consider the distinctive mechanical features, the high-grade material and the skilled workmanship that have been built into the YUBA, it is without comparison.

The combination of the comparable and the incomparable have gained for the Yuba Ball Tread Tractor a reputation second to none.

THE YUBA CONSTRUCTION CO.

Factory at Marysville, California.

433 California St., SAN FRANCISCO, CALIFORNIA

THE YUBA BALL TREAD TRACTOR

THE YUBA CONSTRUCTION CO.
Department C-3

433 California Street,
San Francisco, California

Gentlemen:

Kindly send me a copy of your booklet "The Yuba Ball Tread Tractor."

Name

P. O. Box

Town

State

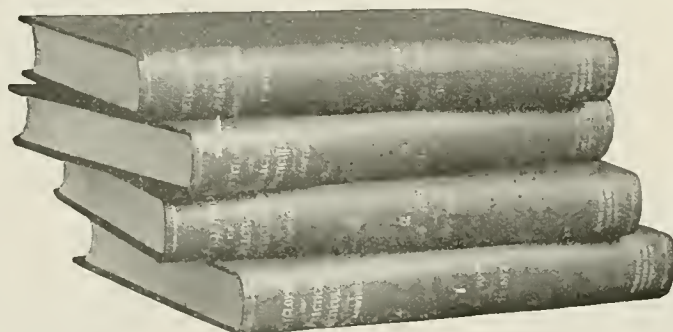
Size of Farm.....acres.

CHECK MAIN CROP RAISED

Fruit Rice

Grapes Alfalfa

Grain Hay Hops



Encyclopedia of Practical Horticulture

"JUST WHAT WE HAVE WANTED"

A SCIENTIFIC work written in plain language and devoted to practical ends.

The only work of the kind now complete and up-to-date. A thorough manual of fruit and vegetable growing, covering every practical feature. Plant troubles, the fullest ever listed in one work with every remedy. Planting, pruning, spraying, harvesting, packing, marketing—all the methods so successfully practiced in the Northwest. Statistics of the fruit and vegetable business. All carefully indexed. Four volumes, 2,064 pages, 700 splendid halftones, drawings and colored plates. 200 contributors.

"Every grower should have it, for between its covers may be found the answer to practically every horticultural problem with which he will sooner or later be confronted."—E. K. CARNES, State Commissioner of Horticulture, Superintendent Natomes Consolidated, Sacramento, California.

Write for circulars and prices to "Better Fruit," Hood River, Ore.

BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Pruning Young Trees

By Professor C. I. Lewis, Oregon Agricultural College, Corvallis, Oregon

MANY orchardists growing young trees have been disappointed with the results they have obtained from pruning. While these disappointments may be due, on the one hand, to a lack of knowledge of some of the fundamental principles underlying pruning, on the other hand, we believe that a very large percentage of the dissatisfaction is due to the fact that the grower has been expecting too much from pruning alone, and has failed to realize the great importance of other orchard practices, such as irrigation, tillage and the maintenance of soil fertility.

No matter how skillfully we prune for fruitfulness, unless we have such soil conditions as to furnish sufficient food and moisture at the right time to develop good, strong buds, we should not expect to secure satisfactory results. Again, we must realize that soil, elevation and climate are factors which have a very close relation to pruning. Likewise, the variety question is always to be taken into consideration. For example, the pruning of Jonathans in Southern Idaho, at an altitude of 2,000 feet, on a silt loam, is an entirely different problem from that of pruning Yellow Newtowns in Western Oregon on a heavy soil at an elevation of 100 feet. While the fundamental principles underlying the pruning of these two trees may be the same, the application of these principles to the two may be radically different.

We need, first, to form a clear understanding of what these principles are, and, second, to study more closely than we ever have in the past the application of these principles to our individual orchards.

The Three Types of Trees

There are three types of trees grown here in the Northwest, the so-called open, globe or vase-shaped tree, the center-leader type and the modified-leader type.

In the vase or open tree three to five branches are chosen to form the framework of the tree; any tendency of a branch to assume the lead is suppressed; no leader being allowed to grow, each of the three to five branches is given equal prominence in the tree. This tree was borrowed from the French and has been modified in this country to suit our special needs; for example, in parts of the Middle West and in California the tree is allowed to carry a large number of laterals, summer pruning or shearing being employed to force out more laterals so as to shade the branches from sun scald.

A dense, compact tree is the result. Here in the Pacific Northwest we seldom use the term "globe" or "vase," but almost always call it the open tree. Instead of shearing to produce shade, our growers prune out and keep the tree open to admit more light. The general framework, however, of the California and Oregon types is the same. Our orchardists claim that the advantage of the open tree is that it allows more light to enter the tree, thus causing a better coloring of the fruit; and, second, it produces a tree that is broad and spreading and easy to keep low-headed. The objections to this tree are, first, that it is generally structurally weak, the scaffold branches issuing at one point, thus making weak crotches, and if one branch breaks out the tree may be ruined; second, this type of tree is used too generally, as it is not adapted to all varieties under all conditions that are found here in the Pacific Northwest.

The so-called leader tree has been used largely in the East on the Atlantic Seaboard, and is used somewhat on the Pacific Coast, especially in British Columbia. There are a few orchards here in the Pacific Northwest where the growers believe the leader to be the

best type. With the leader tree, the center branch is always allowed to have the ascendancy, and the tree grows more or less to the true pyramid. The growers obtain very large trees. It is very difficult, however, to keep them low-headed and to keep them open, but they are probably stronger trees, there being less breakage from this type of tree than from the so-called open tree.

The third type of tree is the modified leader. In this type we start the trees exactly as though we were going to grow the center leader, but, beginning from the second to the fifth year, the leader is suppressed. The advantages of this type of tree are that it allows us to space the branches well, to build strong crotches and main scaffold limbs, and at the same time allows us to keep the tree relatively close to the ground. This type of tree is growing in favor where it has been tried throughout the Northwest.

We would caution the growers, however, that with any of these types of trees, weak trees or strong trees can be built, and also that very bushy or open trees may be attained with any one of the three systems.

The type of growth of trees in your locality may determine to a certain



FIGURE 21—Young Yellow Newtown apple tree before and after summer pruning. Photograph taken in August, 1912.



FIGURE 25—Three-year-old Lambert cherry tree before and after summer pruning early in July.

degree what system you should use. For example, we wouldn't grow the Wagener ordinarily as an open type of tree. It is rather an upright grower for a few years, but later becomes a feeble grower. On the other hand, we should not think of growing varieties like the Tompkins King or Northern Spy as center trees. They shoot up too straight, are too big and are too hard to control. The Yellow Newtown is too often pruned as a typical open tree, and on light soils becomes very weak when twelve or fifteen years of age. A modified leader, or in some cases even the old-fashioned leader, would be better with the Yellow Newtown. On the other hand, on some very strong loams, the Yellow Newtown can be handled very satisfactorily when grown as an open or globe-shaped tree, provided we take a little care in spacing the branches carefully the first two or three years.

The Height of Head

The height of head is only a relative term. One man would say that thirty inches was a low-headed tree; another man would say that this was extremely high. The Pacific Coast grows low-headed trees. We have found by experience that these are the easiest to care for, that they are the most economical for thinning, harvesting, spraying and pruning, and that we can shade the trunks and main scaffold limbs better with this type of tree than with a high-headed tree. In parts of the Inland Empire they often head their trees very low, about eight or nine inches. Many of the Jonathans in the Rocky Mountain district, and in certain portions of Idaho, Eastern Oregon and Washington, are headed in this way and are giving satisfactory results. Under such conditions they must protect the trees as much as possible

against sun scald. However, in Western Oregon we would consider 20 to 25 inches a better height of head. Many growers have felt that about 20 to 25 inches is the proper height for apples and pears. Peaches should be headed very low, as low as they can be grown. Cherries should be headed at about 25 inches. Prunes should be headed at about 30 to 35 inches. We used to believe that walnuts should be headed very high, 7 or 8 feet, and no laterals allowed to grow the first few years, but we are finding this was a mistake, and that about 35 inches will make a splendid head for walnuts.

Season for Pruning

Here in the Northwest, in speaking of seasons for pruning, we generally only consider two seasons, namely, the winter and summer. We receive many letters in regard to early fall or late spring pruning. There is no question but that in the Northwest, where mild winter conditions prevail, winter pruning may be done safely most years at any time when the trees are dormant. In those sections of severe winter conditions, we would advise delaying the pruning as late as possible before the growth starts in the spring. Very rarely would we advise fall pruning in the Northwest, unless one has such a large acreage that it is going to be impossible to complete it unless the pruning is commenced early in the season. If it becomes necessary to prune trees in the fall or very early winter, we would suggest that the growers prune the older trees first, leaving the younger trees for the last pruning. We would caution against pruning trees when they are frozen, and would advise delaying pruning until freezing weather is over. Much heart rot and dieback has resulted from pruning frozen trees. It is possible to prune trees somewhat even after they come out fully in the spring. This is especially true with peaches, and will be discussed in another section of this article.

As regards summer pruning, this is becoming of such interest and importance that we shall treat it under a special head.

Three Lessons to Learn in Pruning Young Trees

There are three great fundamental underlying principles connected with the pruning of young trees. You might say that there are three lessons, and that if these are mastered the problem



FIGURE 26—At left: Vigorous five-year-old Wagener tree pruned in July. Photograph taken in October. Note that there has been a vigorous response of new shoots averaging fully one foot in length as a result of the summer pruning. At right: Five-year-old Wagener apple tree of less than average vigor pruned in July. Photograph taken in early October. There has been practically no growth response as a result of the pruning.

of pruning young trees becomes rather simple, but unless they are mastered it is difficult to develop strong, well-balanced young trees.

Lesson 1. To Choose and Space the Scaffold Branches.—If you grow an open or modified leader type of tree, four or five branches are what we recommend. If you grow the typical leader tree it does not make as much difference, as from year to year new branches are added. We prefer here in Oregon the four or five-branched tree. While it may be true that the three-branched tree will produce three branches that average larger in diameter than if four or five are allowed to grow, nevertheless we feel that the three-branched tree is a dangerous one; that it is structurally weak; that if you lose one of the three branches you have practically a ruined tree; whereas, with four or five scaffold limbs, you can lose a branch and still balance the tree in such a way as to save it. The first lesson, then, is to choose four or five well-spaced branches, having them issue in a whorl around the tree, if possible, and having them as far apart as they can be conveniently spaced. The farther apart they are spaced, the stronger and better will be the trunk and the better the tree obtained. To do this you must not neglect the tree as soon as it is headed, but must watch it very carefully the first month or two after it is set out. It will be necessary to rub certain undesirable buds off, to remove certain undesirable branches, or possibly to suppress from time to time certain branches which tend to run away with the tree. By observing these simple rules you can build a stronger tree. It is for this reason that we often advocate that instead of cutting the tree at 20 inches at the time it is set, cut it 25



FIGURE 28—At left: Five-year-old Wagener apple tree which was summer pruned in July. Photograph taken the following January. Note the amount of after-growth, indicating that the tree was pruned at about the right period. A splendid type of modified leader. At right: Same tree after winter pruning. Note the light amount of wood which has been removed in thinning out; almost no heading back.

or 28 inches, and then space the branches from as near the ground as you can get them up to the top of the trunk. However, if you cut the tree at 25 or 28 inches and then go away and leave it you will often find all the branches will develop near the top of the trunk and the tree will be weak. It is only by careful watching that the extra increase in height of head can be made of any material advantage.

Lesson 2. To Keep Main Branches or Sections of the Tree Properly Dominant.—If one branch tends to grow at

the expense of the rest of the tree the weaker branches gradually become side branches to the two or three remaining stronger branches. If proper pruning is done this can be obviated. We find that the average pruner does one of two things. He may be among the group that cuts the tree level across the top, so he has a plain surface. This will never build a strong, well-balanced tree, because in doing this you pay no attention to the relation of one branch to another. The second group of pruners is apt to cut the weakest wood most and the strongest wood the least. They have heard that the more we cut the wood the more it grows; therefore, if wood is weak and we cut it back it will grow stronger. It is true that the more a tree is pruned back as a whole while dormant the more will be the resulting growth; that heavy heading in of a tree means a heavy after growth. This, however, has to do with the trees as a whole and has little to do with the relation of one branch on a tree to another. If you have a strong branch in close proximity to a weak branch the best way to strengthen the weak branch is by cutting back the strong. The development of the weak branch will be in proportion to its leaf and branch area; if there is a large amount there will be a heavy demand on the sap, and the weak branch will develop. By limiting the branches and leaves on the strong branch you restrict its growth; as a result the following year there will be less discrepancy between the development of the two branches and a continuation of the practice should lead to a balance between the two. The heading back should be done, then, not so much from the point of view of the tree as a whole, but from the point of view of the relation of the branches to each other.



FIGURE 27—At left: Five-year-old Yellow Newtown apple tree which was pruned the previous summer. Note length of shoots which resulted from summer pruning. At right: Same tree as shown at left after winter pruning. Note that the pruning has been light. This tree is reaching the critical period when it should commence to bear. Heavy pruning might keep it from bearing.



FIGURE 29—Balance in pruning. Note at AA equal cutting has resulted in nearly equal strength of branches; at BB unequal cutting has resulted in completely destroying such balance, making a stronger crotch.

Cut the strongest branch the hardest; cut the second branch in vigor not quite so much; the third in vigor still less, until you come to the weakest branch, which should be cut the least. It is only by suppressing the strong branches, limiting the number of leaves and buds that they have, that you can possibly hope to encourage the weaker branches. If you wish to grow a modified tree, or leader-type tree, the only difference we would make in this pruning would be that we should choose one branch for a leader and not cut it back quite so heavily as we should with the open tree, simply letting it have enough of a lead to maintain that position. Other than that we should prune all the branches the same as directed. We can do a great deal of so-called corrective pruning. That is, we may have a tree four or five years old and notice that two of the scaffold branches are weaker than the rest of the tree, consequently we would like to encourage these two branches to grow stronger and larger. To do this, prune these two very lightly and prune the other parts of the tree more heavily, and thus encourage the two weaker branches.

Lesson 3. To Avoid the Sharp-Angled, Equally-Balanced Crotches.—If we examine the average scaffold branch of a tree carefully, from the time it leaves the main trunk up to its last year's growth, we shall observe that it has been developed much along this order. The first year the branch was cut back it forced out a number of laterals. All the laterals except two were removed. These two were cut equally and in most cases were not spaced very far apart. The next year on each one of these two the same treatment was repeated. Two branches were chosen and these were cut equally. The result is that the branches all over the tree are in pairs, of equal strength, and form very sharp forks. Now, this makes a weak branch, one which will break very easily, as the stress and strain all come at very critical points, namely, at the numerous balanced crotches. To avoid this condition of a tree, treat each one of your main branches as a leader. This means that when you choose two branches, at the first you will choose them as far apart as you possibly can, and, second, in pruning these you will cut one harder than the other. Thus one will

become a leader and the other a side branch. If you continue this, the whole branch becomes a strong leader, with a great many side branches, which distribute the strain in such a way as to reduce the breakage to a minimum.

Classes of Non-Bearing Trees

For convenience of discussion, we may divide the young or non-bearing trees into three classes: First, those trees from one to four years of age. This is the formative period, the body-building period of the young tree. Second, the period from four to seven years of age. I have called this the critical age. It is a transition period from the body-building, on the one hand, to the heavy-fruited on the other. With Yellow Newtowns, Baldwins, Winter Nelis, Comice, and many others we could mention, the pruning at this time will determine to a very large degree the fruitfulness of the trees for a number of years to come. The third class or group of trees are those from seven to twelve years of age, which have reached the bearing age, but as yet have not borne a commercial crop. Before taking up the details of pruning these three classes of trees, summer pruning and its relation to such trees may be considered.

Summer Pruning as Adapted to Young Non-Bearing Trees

During the past two years we have heard much about summer pruning, and with many summer pruning has become a fad, and some expect marvelous results. While summer pruning is not new, it is true, however, that it has been more generally used the past few years than formerly, and like everything that is just coming into general practice, is being overdone. Many people are expecting too much from summer pruning.

Let us consider first the summer pruning for our young trees during the formative period, that being the ages from one to four. In many cases not much pruning will be done during the first summer of the tree's life, as the trees often do not make very much growth the first season, but where they do make a vigorous growth and make it by the middle of June or early July it will often be found to advantage to head the trees at that time, cutting them back just about the same way that you would cut them back the following spring. That is, if you have a long terminal growth, 12 to 30 inches in length, cut it back to the point where you desire to force out new laterals for the future body building of the tree. Now, you may have a tree that is running to one or two branches at the expense of all the others. It would be well to pinch back these strong branches so as to hold them back for the time being and thus encourage the weaker branches to grow. By the second year nearly all these trees can be greatly benefited by summer pruning. This may come any time from the latter part of May up to the middle of July, generally about the middle of June. It consists of cutting back the

rank terminal growth so as to force out the laterals and allow them to make a good growth and become hardened before fall. In this way you will gain a whole year in the framework of your trees. A good practice to follow with such trees is to do most of the heading back in June and most of the thinning out in March or April, or whenever the winter pruning is done. However, should the trees after they are pruned in June make such a rank growth that they need some topping back again the following spring, you should by all means do so. In nearly all cases it will be advisable to do some topping back of the terminals, or else the terminal bud will incline to continue this growth, producing a long leggy branch. If no topping is done on these shoots in spring it will be necessary to give them a heavy heading back in summer, to prevent their becoming too long before producing desirable laterals. You should remove from these young trees, during the summer time, any undesirable growth, branches which you know will never be of any value to the tree and are growing at the expense of some branch which should be developed. We would caution, however, against the too strenuous thinning out of young trees. We are of the opinion that we have overdone the thinning out of lateral branches.

This pruning which is given to these young trees, while it does not as a rule directly induce fruitfulness, will tend to bring the trees up to the critical period in much better condition than otherwise, since it tends to balance the tree; and since it distributes the pruning over two periods of the year, it eliminates the necessity for very vigorous pruning which so many growers give trees. The heavy winter pruning given young trees serves as a stimulus and often causes too much vegetative growth.

Some growers are opposed to summer pruning on the grounds that such pruning weakens the tree, that it is devitalizing, that it is unwise to remove any of the leaves as they are the "lungs" and manufacturing organs of the tree. We feel that it would be only in very extreme cases that summer pruning would ever be devitalizing, and certainly not where one makes the single summer pruning as already recommended. Such pruning in some cases might give increased vigor; in others very little difference will be noted; while in still others the growth may be modified to the extent that there is less vegetative growth, but even in the last case there is modification rather than devitalization. The result of a single summer pruning as recommended for these young trees is not so much a question of vigor as it is a question of change in direction of growth or energy. The clipping back of the terminal, forces the growth into desirable new lateral framework rather than into a useless additional terminal growth. There are cases where frequent summer pruning at short in-



FIGURE 30—An example of unequal growth. Branch A is growing at the expense of the other branches in the tree and should be suppressed.

tervals during the summer has a tendency to check or dwarf a tree; for example, in growing dwarf trees we must not only have a dwarfing stock but we must practice frequent pinching back of shoots. Again, we have seen walnut trees dwarfed by removal of all lateral growth for a period of years. These last two cases, however, are extreme and represent excessively frequent pruning. The greatest danger of devitalizing young trees does not come from a single summer pruning, but rather from allowing too heavy bearing of young trees.

We shall now consider summer pruning as related to our second class of trees, namely, those from four to seven years of age. These trees have now gone through their formative period and should have good trunks and scaffold limbs, and should be approaching that period when they can begin to bear heavy crops. We shall modify summer pruning for these trees, as compared with the younger trees. In this case we are to work with the idea of trying to induce fruitfulness

directly if possible. The pruning will generally come considerably later with these older trees. There is no definite time to set. We recommend, however, that the pruning be done at the time the terminal buds are forming on the ends of the shoots. You will note the leaves are beginning to get larger on the ends of the twigs, and if you will look closely you will see that the terminal bud is forming. At that time, which in the Willamette Valley, for example, is generally about the middle of July, we cut back the terminal growth, cutting it back to the point where it is desired to force out new laterals for another year's growth. The cutting at this time seems to cause a thickening of the branches, probably an accumulation of tissues around the buds, and with some varieties, probably, will lead to direct fruiting the following season. With others, however, it will simply tend to keep the trees in balance, and probably encourage earlier fruiting than would otherwise be true. That is, your results may come in two or three years rather than in one year. If this prun-



FIGURE 31—A good example of proper balance between branches. Note that wherever there is a crotch in most cases one branch is stronger than the other. At A.A. is a bad fork due to even cutting.

ing is done at about the right time very little secondary growth will take place, and what does will naturally be very small. Of course we realize that in many cases these trees four to seven years of age do not harden up until late in September or even in October, and then it would be too late to do any pruning to advantage. Even though summer pruning with these trees might not lead to an increase in fruiting the following summer, it would be a dis-

inct help in keeping the trees in balance and in eliminating the excessive cutting which might otherwise be necessary the following spring.

We shall consider for just a moment the trees which are from eight to ten or twelve years of age which should be in fruiting, but have never borne. These trees have almost always been over-stimulated. They have been over-pruned, over-tilled, over-irrigated; they have had some one stimulus or a combination of stimuli given them which results in forcing back wood growth, producing heavy large leaves, but little or no fruit. The remedy is to remove the stimulus, whatever it may be, and prune several times a year.

Summer pruning for such trees will come probably more about the time you should prune the very young trees; that is, along in June. At each time when the terminal growth has reached such a length that you can see it is going to become excessive, it should be cut back and the trees thinned out somewhat, and the following spring a little more thinning and pruning out could be done to advantage. The application of summer pruning to these trees

should be largely merely a distribution of the pruning over two periods, thus avoiding an excessive pruning. Only in very rare cases could you expect direct results from such pruning. Results will come indirectly in bringing the trees back to their normal balance. It often becomes necessary to reduce the amount of tillage or irrigation given such trees and in cases where the growth is abnormally excessive it is sometimes found advisable even to check this by growing crops between the trees, such as hay or grain.

Continued in next issue

It is reported that Mr. H. F. Davidson states that the guarantee-fund plan which was instrumental in advancing the price on pears in Yakima Valley, made \$10,000 extra money for the pear growers. Prices on pears were advanced from \$15.00 to \$17.50 per ton; and by the box went from 65 cents to 75 cents to 85 cents. Bartlett pears, which started low at the early part of the season, the latter part of August were reported as selling at \$1.00 per box in various districts throughout the Northwest.

The cherry crop of the Northwest has brought excellent prices this year. Canneries have paid five cents per pound for Royal Anns, or \$100 per ton. One cherry grower in Hood River, J. R. Nunamaker, realized considerably over \$4,000 on four acres of cherries.



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Horticultural Exhibit Panama-Pacific Exposition

[Editorial Bureau, Panama-Pacific International Exposition]

THAT the horticultural exhibit at the Panama-Pacific International Exposition at San Francisco will far surpass in magnitude and general scope all previous exhibitions of the kind held anywhere is the opinion of experts who have examined the exhibit in detail. Fourteen acres will be devoted to horticultural purposes, five of these covered by the Palace of Horticulture, a \$341,000 structure with a great glass dome 152 feet in diameter as the hot-house center, and nine acres of outside garden. The horticultural exhibit, within the palace and without, will include representative displays touching practically every important phase of horticulture as it is carried on in China, Japan, England, Scotland, Ireland, Australia, New Zealand, Canada, The Netherlands, France, Italy, Argentina, Cuba, the Philippines, Hawaii, and the following states of this continent: Oregon, Washington, Utah, Idaho, Montana, Nevada, California, Colorado, Missouri, Kansas, Arkansas, Illinois, Iowa, Indiana, Ohio, Louisiana, New York, Massachusetts, Rhode Island, Pennsylvania, New Jersey, Florida and Maryland.

As a whole the horticultural exhibit of the exposition has been planned with a fivefold purpose: to appeal with equal interest to the tourist, the visitor, the student, the business man and the investor. The tourist will see the pride and the glory of the soil from the other sections of the world. The visitor will be entertained by the beauty and novel wonder of all that is before him. The student will find here an unexampled opportunity to increase his knowledge on all points pertaining to the horticulture of the earth. The business man

will find the exhibits of commercial products so arranged as to permit the placing of orders on the spot. And the investor will be able to discover through actual living evidence the productive possibilities of soil from almost every section of the earth.

Every participating state and nation will have part of its display in the outside garden. The Netherlands and the State of Massachusetts will show their exhibits outdoors exclusively. Holland's unified exhibits were presented under the auspices of the National Board of Horticulture and will present the quintessence of floral culture as it is carried on by the famous growers of that country. A flowering mass of 60,000 bulbs is but an item in this gorgeous part of the exposition. Trees which have attained years of growth in their native Dutch soil will be seen here. Rhododendrons, trained conifers and numerous growing botanical specimens will be seen, all set out in a landscape effect arranged by D. T. Tersteeg, of Maarden, Holland, the most noted of the landscape architects of his country. Massachusetts' display will be representative of the state and will be presented by her most noted growers. It will be a Colonial garden designed by Stephen Child, one of the foremost of his profession in the United States. Notable features will be gladioli exhibits by Arthur Cowes, John Lewis Child and B. Hammond Tracy, the most noted gladioli growers in America. There will also be a magnificent assemblage of stately carnations, showing new varieties. The California exhibit will include an extensive showing of Luther Burbank's famous creations. The Japa-

nese garden will be a rare work of art and will hold many surprises for the exposition visitor.

In that portion of the exhibit known as the "Eastern garden" will be found a magnificent exhibition of roses from Rhode Island and Maryland, heliotropes of exquisite color and rich fragrance from New Jersey, and iris and peonies from Pennsylvania. The rose competition has excited international interest. A prize of \$1,000 has been offered by the exposition to the grower producing the finest rose, hitherto unnamed and unexhibited, but which is to be brought forth for the admiration of the world at this exposition. The prize will be awarded by an international jury of award and whatever rose receives the award will be given a name commemorative of the exposition that brought it to fame. Among the renowned rose growers who will have entries in this contest are Hugh Dickson, Belfast, Ireland; Samuel McGredy & Son, Potst-down, Ireland; E. Pernet Ducher, Venissieux-Lyon, France; Dobbie & Son, Edinburgh, Scotland; S. Bide & Son, Farnham, Surrey, England; E. G. Hill, Indiana; Brant-Hentz Flower Company, New Jersey.

In the palace the visitor will find beneath the great dome the exhibit of Cuba, myrocytus 1,000 years old, royal palms, giant tree ferns, tropical lilies, bamboo palms, breadfruit and banana trees, mangoes, guanabana, cocoanut trees and date palms in actual bearing. Hawaii, Australia and the Philippines will exhibit tropical displays, from the Philippines coming one bed of 400 varieties of orchids, all different, but blending their wealth of colors in one picturesque expanse of beauty. A feature of Japan's display will be an aquarium of gold fish, giving the typical Oriental finish to the exhibit of rare specimens from that country.

The economic section of the horticultural exhibit will also be housed in the palace, the idea here being to show plant life in its relation to actual life. A model cannery, the combined exhibit of the National Canners' Association,

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is given on page 4.

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will be shown in operation, conducted by Dr. and Mrs. A. W. Bitting, the most noted technologists in America. The cannery exhibit will demonstrate the various processes involved in fruit canning, from the moment the fruit is received in boxes to the final detail of being crated for delivery to the grocer. There will be a comprehensive exhibit of dried fruits in airtight sanitary packages. An ingenious display of horticultural machinery will be a feature, showing everything up-to-date in the line of appliances and implements. In general the exhibits cover every detail pertaining to the soil, its cultivation and adornment.

Destroy Insects by Fall Plowing

If you want to kill the army worms, cutworms, Hessian flies, grasshoppers and other highly injurious insects plow your fields this fall. Fall plowing, disking and harrowing within the next few weeks will break up the nests, cells and protecting cases of many insects and expose them to the rigors of winter weather. This will completely destroy many of our most injurious insects and greatly diminish the numbers of others. Fall plowing does not affect all insects alike because they pass the winter in the soil in different stages. The grasshoppers and the corn root lice pass the winter in the egg stage; the cutworms, army worms, wire worms and white grubs hibernate in the soil in the worm stage; the fall army worms, corn-ear worms and garden-web worms pass the winter in the pupa or resting stage; and the click beetles, May beetles and potato beetles hibernate in the soil as adult beetles. Many insects are crushed and destroyed in their wintering stages by plowing and disking. Others are brought up nearer the surface, and not being able to go deeper into the soil or to construct new cases are exposed to the ravages of birds and other animals. They are also subjected to excessive cold and moisture, to alternate freezing and thawing, and are killed. Old wheat stubble fields full of volunteer wheat, weeds and grass are now harboring Hessian flies, army worms, cutworms, grasshopper eggs and plant lice, all of which may be destroyed by fall plowing. If these old stubble fields are not plowed until next spring serious injury may occur to corn, wheat and other crops in the neighborhood. The Hessian flies coming from the volunteer wheat next spring may completely destroy late-sown wheat.—T. J. Talbert, University of Missouri, College of Agriculture.

How to Make Vinegar

The housewife, either on the farm or in the city, who makes her own vinegar may be assured of both its purity and strength if she follows certain specific directions, according to Miss Carrie Pancoast of the Missouri College of Agriculture. Good vinegar can be prepared from cider. Fill a barrel or cask half or two-thirds full. A considerable surface of the liquid must be exposed

to the air. For this purpose, bore two-inch holes in opposite sides of the barrel—one near the surface of the liquid and one near the top of the barrel. Cover the holes with wire netting to prevent the entrance of flies. One of three methods may be pursued in the formation of vinegar from the cider—(1) allow the cider to stand until souring occurs; (2) add a little vinegar of good quality, or (3) hasten the process by the addition of the "mother of vinegar," a portion of the film which has developed on the surface of vinegar previously prepared. Part of the vinegar may be drawn off and the loss made good with fresh cider, using care not to break the film. The added cider will rapidly be converted into vinegar, and the process may be repeated in three or four weeks. When drawn off, the vinegar should be strained and placed in tightly-stoppered vessels—otherwise it will lose its strength.—University of Missouri.

The Pacific International Live Stock Exposition will be held in Portland at the Union Stock Yards, North Portland, December 6-11. As many fruitgrowers are going extensively into the dairying business, hogs and sheep as side lines, this exposition, which is one of the finest held in the Northwest, or anywhere else in the United States for that matter, will give every visitor wonderful opportunities to learn about stock, the care of stock, and the kind of stock that pays to raise. No fruitgrower who is raising stock or expecting to should fail to attend this show.

The Oregon Nursery Company, Orenco, Oregon, one of the largest and most progressive nurseries in the Northwest, has added a landscape gardening department, having secured the services of a specialist, Mr. H. E. Burdette, who is a practical man in this line of work, for the purpose of assisting all patrons of this company to enable them to lay out their gardens, lawns, etc., around their homes in the most attractive manner possible.

PORTLAND WHOLESALE NURSERY COMPANY

Rooms 6 & 7, 122½ Grand Ave., Portland, Oregon

Wholesalers of Nursery Stock and Nursery Supplies

A very complete line of

Fruit and Ornamental Trees, Shrubs, Vines, Etc.

SPECIALTIES

Clean Coast Grown Seedlings

Oregon Champion Gooseberries and

Write Now Perfection Currants Write Now

Caught 51 Rats One Week

Trap resets itself; 22 inches high; will last for years; can't get out of order; weighs 7 pounds. Cheese is used, doing away with poisons. This trap does its work, never fails and is always ready for the next rat. When rats and mice pass device they die. Rats are disease carriers, also cause fires. Rat catcher sent prepaid on receipt of \$3.00; Mouse catcher, 10 inches high, \$1.00. Money back if not satisfied. One of these rat catchers should be in every school building.

H. D. SWARTS, INVENTOR AND MANUFACTURER

Universal Rat and Mouse Trap

Box 566

SCRANTON, PA.

Planting Narcissus, Daffodil and Tulip Bulbs for Next Spring

There is nothing that will beautify a lawn quite so much as a bed of tulips, daffodils and narcissus blooming in the early spring. The beds should be prepared in the fall. As a general rule bulbs should be planted in October and November, so that the roots may make a good growth before cold weather sets in. Bulbs require a moderately rich soil that is well drained. Narcissus and daffodil bulbs should be set about ten inches apart and five inches deep, and tulip bulbs should be set five inches apart and four inches deep, but this will depend largely on the size of the bulb. A good rule to go by is to cover the bulbs with soil one and one-half times their depth. When the ground freezes it is a good idea to cover the beds with a light mulch of straw or leaves, which should be removed early in the spring. After blossoming in the spring allow from six to ten weeks for the foliage to die, when the bulbs can be taken up. Shake the soil from the roots and put them in a cool place where they will ripen, until time for planting in the fall. If bulbs are wanted

for house culture the soil should be light and rich, one-third good soil, one-third sand and one-third thoroughly rotted manure, and the bulbs planted thickly, so they almost touch. As soon as planted they should be well watered and put away in a cool dry place. If the room is light they should be covered to keep them dark. If the soil gets dry water them, but not oftener than every two weeks. Bring them out after about four to six weeks, when they should be watered freely. A very good idea, if one has several pots of bulbs, is to bring them out about two weeks apart, and in this way a succession of flowers can be had all winter and spring.

The North Pacific Fruit Distributors through their manager, J. H. Robbins, state that they will control about the same percentage of tonnage this year as last year. J. H. Robbins, manager, attended the International Apple Shippers' convention at Chicago and reported the apple crop of the United States much less than last year—approximately about 50 per cent.

Mr. Wilmer Sieg, sales manager of the Hood River Apple Growers' Association, attended the International Apple Shippers' Association meeting held in Chicago in August, reporting the apple situation as much more favorable in the way of prices this year. In fact Mr. Sieg is optimistic about obtaining reasonably good prices this year.

B. A. Perham, sales manager of the North Pacific Fruit Distributors, reported in August that the peach crop would amount to 1,200 carloads, and it is also his opinion that the crop will be marketed west of Kansas City and Minneapolis.

Mr. John Steel of Parma, Idaho, who is one of the largest prune orchardists in that state, owning about forty acres in prunes and sixty acres in apples, has signed up his crop with the North Pacific Fruit Distributors.

Mr. L. J. Blot, formerly of the North Pacific Fruit Distributors, is sales manager of the Spokane Fruit Growers Co., a man credited with having splendid salesman ability and an extensive acquaintance with the trade.

The strawberry weevil pest is reported as doing extensive damage to the strawberry patches around Kennewick.

Loganberry juice has been given a great boost through the praise awarded it by William Jennings Bryan.

The pear crop of all of the Eastern States is reported much less than last year.

Rats.

H. D. Swarts, of Scranton, Pa., has invented a rat catcher that caught over 100 rats in a month in one establishment. See his ad. in this issue.—Adv.

FALL SOWING

Tested Vetch, Clover, Timothy and Grass Cover Crops—Sold by Dealers
Send for Price List.
The Chas. H. Lilly Co.
Seattle, Wash.
U. S. A.

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Cold Store

—your APPLES with us in LOS ANGELES and feed out to the consuming public as market demands and PRICES SUIT.

LOS ANGELES is the distributing center of the great Southwest.

California apple crop 1,800 cars short this season.

Big Market for your Apples.

We operate the largest and best equipped Cold Storage warehouses on the Pacific Coast.

DIRECT RAILROAD CONNECTIONS — RATES REASONABLE.

We shall appreciate your business and will show our appreciation by the high quality of service we render you.

If we can be of service to you in furnishing data on market conditions, feel free to call on us and it will be our pleasure to serve you.

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P. O. Box 643, Station C

Los Angeles

California

Hood River Pruning & Grafting Wax

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HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
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All Communications Should Be Addressed and Remittances
Made Payable to

Better Fruit Publishing Company

E. H. SHEPARD, Editor and Publisher

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Over Production.—About six or seven years ago, at one of the National Apple shows, in an address made by one of the railroad presidents, he stated that in the year 1915 the Northwest would ship 50,000 carloads of apples and in the year 1920 150,000 carloads of apples. A short time afterwards, Better Fruit editorially stated that it did not believe the apple shipments in 1915 would exceed 15,000 carloads, to any great extent. The year 1915 has arrived and nearly gone. The apple tonnage of the four Northwestern states will be in the neighborhood of 7000 cars and some estimate as low as 6000. Last year the shipments were somewhere between 12,000 and 13,000 cars. Had this year produced a normal crop instead of about 60 to 70 per cent, on account of the increased age of the trees the tonnage would have been somewhere around the neighborhood of 15,000 cars and in all probability would not have exceeded that amount very greatly. The Northwest, on an average, has not increased in tonnage probably more than 20 to 25 per cent over any previous normal year which was not exceedingly heavy or unusually light. If this rate of increase should be continued and maintained, it would mean that in the year 1920 the Northwest would probably ship about 30,000 carloads. However, it is possible and even probable that the increased planting during the years 1910 and 1911 will increase the tonnage beyond the estimated 25 per cent per year, and it is possible that the Northwest in the year 1920 may ship somewhere between 30,000 and 50,000 carloads, which is a long ways from 150,000 carloads, as prophesied by a prominent speaker at the National Apple Show a few years ago. It must be evident to a man who

is familiar with the tonnage and the Northwest conditions, that the enormous over production is not the bugbear that a good many prophesied it would be a few years ago. When the slump first came in 1912, apple plantings stopped. Consequently there has been no setting of trees since that time. In the year 1920 all of the trees set in the Northwest will be eight years of age, when they reach a fair bearing capacity. After that time, therefore, it is doubtful if there will be any material increase in the tonnage of apples in the Northwest for some years to come.

Marketing Wormy Apples.—The codling moth was more severe in the Northwest in its ravages this year than for many years in the past. In various districts the damage done in the way of stings and worm holes has been estimated in many orchards as varying from 10 to 75 per cent. Of course there are a number of orchardists who have been extremely successful, who have sprayed so thoroughly and so well that their damage is less than 2 per cent. In some districts, special arrangements have been made for marketing fruit damaged by the codling moth, the authorities feeling that on account of the short crop, there would be an opportunity to dispose of this fruit, helping out the grower and accommodating the public by supplying this grade at a moderate price. Consequently arrangements have been effected by which fruit affected by codling moth can be shipped in vegetable crates, unwrapped, making it evident that there is no misrepresentation. Of course where the quantity of fruit affected by codling moth is large in the district, it is only natural that growers should want to realize in some way if possible. It is to be regretted that such a condition exists. The districts which have only a small quantity affected in this way are indeed fortunate, because they can well afford then to send this grade to the vinegar factory. One observation in conclusion seems important, and that is, this fruit should be marketed with good judgment and kept out of our best consuming markets that handle our extra fancy and fancy grades of fruit, for which they are willing to pay a satisfactory price. The Northwest must keep up its standard of quality to the fullest possible extent.

Advertising the Apple to Increase Consumption.—Every man connected with the marketing of apples appreciates fully the importance of advertising to create a demand. In fact, a great many growers also realize the importance of an extensive publicity campaign. The trouble seems to be, however, this year in raising a sufficient fund. The apple growers were short on account of low prices last year, and although the price looked good for this present season, the average apple grower considers himself wise, and is not going to spend any money before he gets it. Under these circumstances, it was difficult to raise the fund necessary for the right kind of an advertis-

ing campaign, but with the value of advertising made evident to the fruit grower, with good prices and good returns this year, there is little doubt but what the growers in the different districts will come cheerfully forward next year with enough per box, through the associations through which they ship, to put on a campaign that will increase the consumption of apples and create an increased demand, just the same as the demand has been created and the consumption increased by the orange growers in Southern California and all the different food product manufacturers of America, like Cream of Wheat, Toasted Corn Flakes, Sunny Jim, etc.

Walnut Growing.—The success of the early pioneers in the English walnut industry, originally in the Willamette Valley, was so marked that a great many walnut groves have been set during the last few years, which have very recently come into bearing and are fulfilling in every way the expectations of the planters, who are producing good crops of superior quality which are selling at a good price. The Franquette walnut seems to be the favorite. The Mayette is another variety favored also. The Franquette is one of the best flavored walnuts that the editor has ever tasted. Last year he was presented with ten pounds, and unhesitatingly pronounces it the best flavored walnuts he had yet tasted. There are a great many walnut groves in the Willamette Valley which are producing quite extensively, a ready market being found for all that is produced. Recently considerable attention has been given the walnut industry in the Yakima Valley, and upon investigation, Mr. Wiggins of the Washington Nursery, has found a grove which is over thirty years old, in fine condition, the nuts being large and of excellent quality. It is quite evident from the success of this grove and odd trees planted here and there, that the climate and soil of the Yakima Valley is suited for the tender walnuts such as mentioned above. The walnut growers of the Northwest are showing their interest in the development of the industry, holding a meeting in Portland, during the first week of November.

The Value of Our Association Salesmen.—Too frequently we hear the remark: "I can sell apples just as well as anybody else." Perhaps you can; but in order to be a good salesman or sales manager, one must not only be familiar with all of the different varieties and grades, their eating qualities, their cooking qualities, and their keeping qualities, but he must possess a knowledge of crop condition in all of the various districts and above all, he should possess an extensive acquaintanceship with the dealers who are our purchasers. Very few individual growers possess such qualifications. Anybody can sell apples. Yes, but it takes a salesman to realize the market value of our apples, and the market value is all that any one can expect.

By-Products.—The By-Product Committee has not accomplished as much as was anticipated, for which there seems to be a very good reason. After considerable investigation on the part of the By-Product Committee, it wisely arrived at the conclusion that the whole success of the fruit industry did not depend entirely on by-products or primarily upon by-products, but that the future of the fruit industry must depend, first, upon the satisfactory distribution and sales of fresh fruit, and therefore most of the members of the By-Product Committee realized the necessity of assisting to create a market for fresh fruits, giving most of their

The Power

is given on page 4.

There are also other points of interest to orchardists.

W. van Diem

Lange Franken Straat 45, 47, 49, 51, 61

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European Receivers of American Fruits

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Our Specialties are

Apples, Pears, Navel Oranges

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Consignments and Correspondence Solicited

attention and time to that subject. Much has been done along this line by the By-Product Committee, it being instrumental in calling together the Growers' Council. As this influence has already produced good results, it seems timely that the attention of the By-Product Committee should again be called to the subject of by-products. Every year there will be a large amount of all varieties of fruits which for various reasons cannot be marketed as fresh. In the apple business in particular very many apples are either affected by worm stings, fungus, bruises or otherwise below grade, so they are not saleable as fresh fruit. The value of such ranges anywhere from \$6.00 to \$10.00 per ton. In the aggregate this is quite a large sum to the fruit grower, particularly the one who has a large-sized tract. As an instance, a fruit grower who has a full-bearing orchard with a reasonably clean crop will realize from the vinegar factory about \$9.00 per acre this year. A man with forty acres will average for the by-product factory from one to two tons per acre, which at the low figure of \$6.00 per ton would bring from \$6.00 to \$12.00 per acre. This would mean to the apple grower who had forty acres from \$240.00 to \$480.00; \$480.00 will pay the grocery and meat bills for the average family for a year. With a good by-product factory this means just so much money saved because the fruit grower has to pay out this amount and even more to pick, haul and grade out the stuff that is unshippable, and by disposing of it to the vinegar factory he has the opportunity of getting back his money, and \$480.00 saved in this way is just as good as \$480.00 made in any other way.

South America as an Apple Market.—So many reports have appeared in print about the opportunities existing in South America as an apple market, that it seems worth while for the apple shipping concerns of the Northwest to give South American business their earnest attention. The government recently sent a man to South America for the benefit of the apple growers of America. This man lived there, speaking Spanish. Before going this gentleman visited the editor at his office in Hood River, explaining the situation quite fully in advance. Without doubt South America will take an immense quantity of our fruit, but before this can be done, necessary arrangements will have to be made both in the way of transportation, financing details, and proper connections. But the opportunity is so great that it should have special investigation by the apple growers through their shipping concerns.

Manufacturers' and Land Products Show.—The editor visited the Land Products Show when in Portland last week, and pronounces it the best show that Portland has ever held of this class. The displays of diversified farm products made by the different counties were among the most attractive, interesting and beneficial features of

HERE ARE THE Cut Prices

— ON —

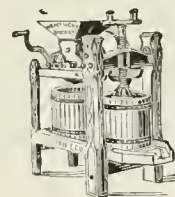
Fruit Ladders

6-ft. Mitchell Tri-Pod Ladder	\$2.40
8-ft. Mitchell Tri-Pod Ladder	3.20
10-ft. Mitchell Tri-Pod Ladder	4.00
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At these prices (for a first-class ladder) you simply cannot afford NOT to send us a money order or check for one of these ladders

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Three Sizes
Prices upon request.

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the entire show. The exhibit of manufactured goods "made in the Northwest" also commanded the attention of the visitor in a very forcible way. The exhibit of home-made manufactured goods will be a strong factor in educating the public as to what is manufactured at home, and with continued effort along this line, a large increase in business can be developed for home manufacturers, which will contribute to the prosperity of the Northwest. The apple exhibits were not large. However, The Dalles had an excellent display of fifty boxes, and Hood River about thirty boxes, consisting of Spitzenbergs and Newtowns. One display, made by Gus Miller, of fifteen boxes of Newtowns, was especially attractive. It is to be sincerely regretted that the apple growers did not take greater interest in the show and make more extensive exhibits. However, the apple grower himself understands pretty well

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Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens, Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN FRANQUETTE walnut, recognized as the best walnut. Our large complete stock consists of varieties suitable for every kind of climate.

Write us about your wants before buying.

Increase your crop—preserve the vigor of you trees by Fall spraying

**Don't
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Fall
Spraying!**

Remember scale is softer, less resistant and easier to kill it the Fall.

Scale hardens and saps the vitality of your trees during the Winter months, making the tree less vigorous, the scale more resistant.

**Write for prices on Lime Sulphur
Bordeaux Mixture, Scalecide**

Free Spray Booklet and our Annual Autumn Catalog of Trees and Nursery Stock and Supplies now ready. Ask for Catalog No. 201.

Portland Seed Co.

PORTLAND, OREGON



"PERFECT" Cement Coated Nails

OUR PRODUCTS ARE OF SUPERIOR QUALITY
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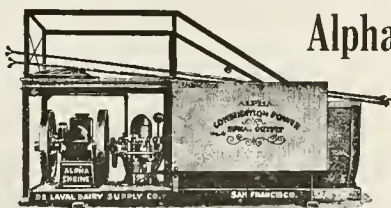
PRICE and QUALITY always right.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.

A. C. RULOFSON CO.

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Monadnock Building, SAN FRANCISCO, CALIFORNIA
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Alpha Combination Power Sprayer

FITTED WITH THE

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ELIMINATES the trouble caused by relief valve.
INSURES safety and absolute uniform pressure regulation.

SAVES in power when nozzles are not in use.

Equipped with 2½ H. P. Alpha Engine that furnishes ample power for high pressure with four nozzles in use. Send for catalog C-2.

Seattle

De Laval Dairy Supply Co.

San Francisco

the reasons; the fact of the matter being that last year prices were so low that the grower did well to make his expenses, many growers not even doing this. Consequently, they have been short of funds and will be up to the time they receive money for this year's crop. The weather being beautiful, every fruit grower was busily engaged in harvesting his crop, putting forth every effort to finish before the rains set in. For these reasons he felt unable to make exhibits on account of lack of funds and did not feel inclined to delay his harvesting in preparing exhibits. This was the condition this year, but it

is to be hoped that next year conditions will change so that the apple grower will take more interest in making exhibits. These are opportunities they should not miss, as this kind of publicity is the best kind of advertising at the lowest cost, which the fruit grower can avail himself of. The show was particularly attractive on account of it being high class in every respect. Every exhibit was one of merit.

The Growers' Council.—While a great many people are unreasonable in their expectations in reference to the Growers' Council, it seems apparent to

the writer that the Growers' Council has accomplished a wonderful amount of good by creating a splendid influence. Some people expected the Fruit Growers' Council to have the power to dictate and set prices. Such expectations were unjustified and unreasonable. No organization can set or fix prices without being a trust and absolutely controlling the situation. If any shipping concern or combination of shipping concerns had a sufficient control of the situation and the tonnage to fix prices by dictation, such a condition might be construed as a violation of the trust laws. But to return to the subject—the Growers' Council succeeded in calling a number of prominent growers together from all over, in two large meetings, one in Seattle and one in Tacoma, and also succeeded in getting representatives, officials, salesmen and attorneys of the various shipping concerns together for a conference. In these meetings a great many things were threshed out. All the different shipping concerns found out that the others had some mighty good men, and every one present concluded that the other fellow was not entirely to blame for the disastrous condition that had prevailed. The result of these meetings has been a better feeling of the shipping concerns, which has resulted in a more harmonious condition and less unnecessary competition. This has been a big factor in assisting the selling concerns to obtain more satisfactory prices for the apple growers in the season of 1915.

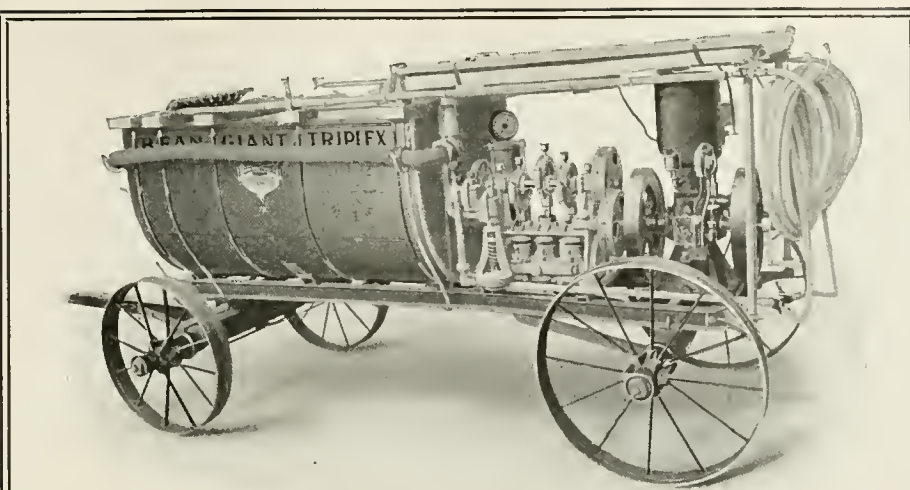
The 1915 Apple Movement.—The local jobbing and trade centers of the Northwest, like Portland, Seattle, Spokane and Tacoma, at the present time are pretty well filled up with apples of the fall varieties and the very early winter varieties, also low grades. Practically all of the apples that are not in first-class keeping condition are being rushed on to the market very rapidly, especially by those districts which have no cold storage facilities. Consequently the market is pretty well filled up with low-grade fruit, very little of the extra fancy and fancy winter varieties being in evidence. Due to the unusual amount of apples affected by codling moth this year and the prevalence of scab in some districts, both of which would affect the value of apples, much of this kind of fruit is being turned loose on the market for the reason that they do not justify cold storage expense.

Stampede Among Fruit Growers.—The fruit industry of the Northwest has certainly gone through a very wonderful and interesting development and evolution. In this development attention is called to the marked stampede among fruit growers, first in one direction, then in another. A few years ago apple growers of the Northwest concentrated all their efforts in an earnest endeavor to produce quality fruit, doing their work well and thoroughly. In fact, they spared no expense, and it might be said they did their work

expensively, without any idea of the necessity for economy. Much money was wasted. During the last two or three years the whole stampede has been toward selling fruit, consequently there has been a lack of sufficient attention to proper producing methods. A great many growers in this last stampede felt that apples would not bring much money this year. Many growers have slipped a cog in their productive methods, which in a large measure is lack of attention. The fruit growers have lost more through codling moth damage and fungus this year than they have for many years. All of which is intended to indicate the fruit grower should devote sufficient time to producing first, clean fruit, and secondly, to devote a sufficient amount of time to the marketing problem to progress in that as well.

Apples in Local Jobbing Centers of the Northwest.—There are four principal consuming, jobbing, and supply centers in the Northwest—Seattle, Spokane, Tacoma and Portland. It has been suggested that these cities should patronize to the fullest possible extent the associations and growers in their respective states. Such a claim is perfectly justified. The growers in Washington are justified in expecting the fullest cooperation from the fruit dealers of Seattle, Tacoma and Spokane, provided of course they, the growers, cooperate in return. The growers in Oregon are justified in expecting that Portland should favor Oregon growers, provided Portland fruit dealers receive proper treatment. There is no reason in the world why the fruit-jobbing concerns in each state should not give hearty support to the fruit dealers in their own state. Not one of the cities above mentioned has consumed the amount of apples that can be marketed. This is an un-worked problem, but it is a problem that certainly is capable of solution. Our dealers in these cities should be cooperated with to the fullest extent by the shipping concerns, with a view to creating the greatest consumption possible in nearby markets, because there is no better market for the producer than the nearby market, when properly handled. The editor calls particular attention to this suggestion, feeling that there is ample ability in every one of the selling organizations to assist in working out this problem so that the increased consumption and sale in our Northwestern cities that growers are entitled to can be realized. It is to be hoped that it will be done. The editor believes it can be done.

Harmony Among the Shipping Concerns.—During a few years previous to 1915 a great deal of bitterness existed between the different shipping organizations, resulting in a great deal of criticism, one association or shipping concern blaming another for demoralizing competition. In their endeavor for tonnage, unnecessary campaign methods were used, which reflected, more or less, in many instances unnecessarily on other shipping concerns. It



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was with some satisfaction therefore that it is to be noted so far this year there is far greater harmony prevailing among the shipping concerns than has existed for several years in the past. In fact, if there is any severe criticism on the part of one concern in reference to another, so far it has not been made public.

European Apple Shipments.—The European apple shipments for the week ending October 23, according to Mahlon Terhune, freight broker and forwarding agent, New York City, were a little less than half the shipments for the corresponding week of last year. It must be remembered, however, that the

shipment of box apples from the Northwest last year was about three times what it was in previous years. Freight and insurance rates are much higher this year, and therefore European shipments will probably be considerably less. However, owing to the short crop in the United States the export markets will not be needed to the extent they are during a year of heavy production.

The consumption of apples can be stimulated if all of the local papers and the big dailies in the cities will publish a few of the excellent recipes that have been published at various times. The O.-W. R. & N. Ry. last year issued a very valuable booklet on "Fifty Ways

I have been to the Expositions and I want to tell you that every man, woman & child who can, by any means, should go. Children of to-day may again enjoy such an opportunity, but you and I—in the prime of life—never.

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World conditions are such as will prohibit similar gatherings during our generation. That is why I say to you—**GO! The San Francisco Exposition closes December 4th.** There is plenty of time yet to see it, but not more than enough. Now is the best time of the year in California, and of the Exposition season. Therefore—**Go Now!**

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of Serving the Apple as Dessert." The Northern Pacific Railway issued a very attractive booklet called "Apple Talk," containing a number of very valuable recipes. Apples can be served as dessert in ways too numerous to mention, and what is equally if not more important, is the fact that there is no more wholesome and healthful dessert than one made from apples, and none that costs less.

Will the Apple Market Advance?—This apparently is a year for reasonably good prices all the way through; First, on account of the short apple crop; second, on account of improved business conditions; third, better marketing facilities. However, the sellers should bear in mind that it is not wise to take the last drop of milk from the coconut. They should remember that there is another year ahead of us, and with their own interests in view, they should not be slow in realizing the necessity of making the price to the dealers sufficiently reasonable so he can make a fair profit.

National Apple Day, October 19.—National Apple Day was celebrated quite universally throughout the United States, and was a great feature in stimulating the consumption of apples early in the season, which is always desirable for the fruit grower and beneficial to the consumer. National Apple Day was originated by Mr. James Handley of Quincy, Illinois. An interesting

article will be found in the October edition of Better Fruit of the life of Mr. Handley and the history of the origin of National Apple Day.

Grading Apples in 1915.—From the reports, a number of apple-producing districts are using extreme care and a thoroughness in their inspection this year. Generally speaking the inspectors are meeting with a hearty cooperation from the growers, who as a rule seem anxious and willing to put up a pack that shall meet grade requirements in every particular. Nothing better can be done for the future of the Northwest apple industry than to put up an honest grade.

Extra Fancy Apples.—The supply of extra fancies in the Northwest is comparatively much less than last year, due to codling moth being worse this year than for many years in the past. Fungus has also affected quite a large quantity. Slight defects like fungus spots do not affect the quality of the apples, but they are not permitted in the extra fancy grade.

The Rural Spirit of Portland, Oregon, is very fortunate, having secured the services of Mr. I. D. Graham as editor. The stock industry of the Northwest has increased very rapidly during the past few years, as illustrated by the fact a few years ago the Union Meat Company of Portland imported 90 per cent of the hogs they slaughtered

from the Middle West, whereas during the past year 90 per cent of the hogs they slaughtered were produced in the Northwest. The stock industry is becoming so important in the Northwest that the Rural Spirit decided to engage the most able man they could secure in this line of work, deciding on Mr. Graham, who is familiar to many of the readers of such publications as the Breeders' Gazette. Mr. Graham is considered a very high authority on live stock and very thoroughly informed on all subjects pertaining to raising stock, feeding stock and caring for stock, and other matters pertaining to the stock industry. His connection with the Rural Spirit will add much to its value, which will be of interest to the fruit-growers, inasmuch as many fruitgrowers are going quite extensively into the dairying business and hog raising.

Rogue River reports an unusually light crop of apples this year, probably somewhere between 100 and 200 carloads, due principally to two causes—drought and frost.

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Some Results of the Apple Storage Investigation by U. S.

E. L. Markell, United States Department of Agriculture, Washington, D. C.

THE problem of fruit storage would be much simplified if the theory held by one of the darkeys working in the government precooling plant in Florida were correct. "What's all dis here machinery, Sam?" one of his friends asked him. "Why, dat's de guberment embalming plant," was the answer. "You puts de oranges in dere an' dey keeps forever." Unfortunately storage of every lype has its limitations, and so far no fruit has been discovered which keeps forever. Exceptional instances do occur—one is continually meeting the grower who overlooked one box of apples in the storage house and found four-fifths of them in good condition the following August, and the other grower, some of whose Jonathans

kept perfectly in his cellar until June. Such exceptions are interesting, but they merely serve to emphasize the fact that what the practical grower is concerned with is the rule of the average, the normal result in the greatest possible number of cases of fruit storage on a commercial scale. It is to determine the normal average results of storage from the behavior of apples of the chief commercial varieties grown in the Northwest, picked and stored under different conditions, that the Department of Agriculture has been conducting these experiments for the past four years.

The apple is an organism, and like every living thing has a definite length of life. Favorable or unfavorable con-

ditions may increase or decrease the normal existence of the apple, exactly as they influence other forms of living organic matter. Centenarians among men have their counterparts in centenarians among apples, but these exceptions do not prove that all apples are capable of such prolonged existence. To secure the maximum length of life for his fruit the grower must determine the conditions most favorable for its preservation.

During its growing period, the apple stores within itself food material that is capable of preserving its life for a considerable length of time after its removal from the tree. These food products are mainly starches and sugars, and by the chemical changes which occur in the apple during the ripening process the starches are changed into sugars, and the sugars gradually break up into simpler compounds. The object of storage is to postpone the final breakdown or death of the fruit by checking these developing processes. Thus the fruit secures the maximum length of life as well as full development.

Much, however, depends upon the fruit itself. The condition of the fruit at the time of picking is a controlling factor. It is a common fallacy to imagine that the greener the apple the better its chances of keeping. A green apple is usually immature and the food stored within it has not reached the stage at which it can be utilized by the fruit after it is picked. In consequence green apples fail to become mellow, but shrivel, while the flesh remains hard and insipid. Immature fruit is also found to be more susceptible to diseases. The skin in particular is more subjeet to scald than that of mature fruit of the same variety. The final death of fruit picked while immature comes more quickly than in the case of that picked at maturity. The work of the Department of Agriculture has clearly demonstrated the importance of picking the fruit at the proper stage. The most striking example of the effect of the degree of maturity at picking time on the keeping quality of the fruit is brought out in the case of Rome Beauty apple, which the following table illustrates:

ROME BEAUTY.

MATURE VS. IMMATURE FRUIT.

Per cent bad scald and decay at withdrawal from storage, and after a holding period of ten days under market conditions. Three-year average. Time in storage at first withdrawal, none to three and one-half months.

	BAD SCALD		DECAY	
	At with- drawal	10 days later	At with- drawal	10 days later
<i>First withdrawal:</i>				
Mature	0.0	2.1	0.0	0.3
Immature	0.0	65.3	0.0	0.6
<i>Second withdrawal:</i>				
Mature	0.0	6.6	0.0	0.3
Immature	26.5	79.5	0.0	0.0
<i>Third withdrawal:</i>				
Mature	1.1	10.6	0.0	1.0
Immature	62.0	93.1	0.3	12.9
<i>Fourth withdrawal:</i>				
Mature	1.3	18.7	0.0	3.6
Immature	72.6	89.6	0.4	23.7

The table shows the results at four withdrawals from storage in January,

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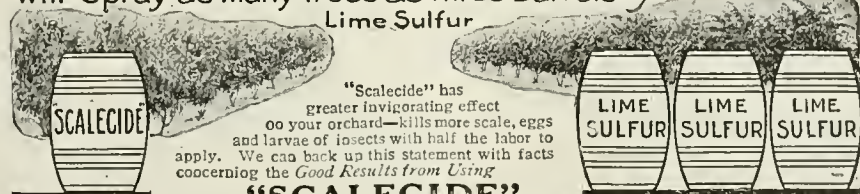
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the middle of February, late March and May. At the first withdrawal no scald showed up, either in the mature or the immature fruit. It was then held under ordinary market conditions, and at the end of ten days only 2.1% of the mature fruit had developed scald, in striking contrast to which is the 65.3% of scald in the immature fruit. At the second withdrawal the mature fruit was still free from scald, but 26.5%, or more than a quarter of the immature lots, had developed scald before removal. Ten days after the last withdrawal 18.7% of the mature fruit showed scald, in contrast to 89.6% of the immature fruit—less than one-fifth of each box in the one case, against almost nine-tenths in the other. Such differences speak for themselves. Ten days after the last lots of fruit had been removed from storage, the decay in the mature lot amounted to 3.6%, but the decay in the lot picked before maturity reached 23.7%.

A greater amount of scald shows up than commonly occurs with other varieties, but Rome Beauty is notoriously susceptible to scald. The natural inference to be drawn from the large amount of scald developing in the picks made before maturity is that in immature fruit the cells forming the skin are weak and break down in storage. After removal from storage they break down still further, and permit the entrance of fungus spores, resulting in more serious decay, as the figures indicate.

The dates at which the apples in the above table were picked are omitted to avoid confusion. Differences of season, section, culture and soil render it absolutely impossible to give a definite statement regarding commercial picking dates for a variety. Many points should be considered in determining whether a variety is ready for picking. In general the seeds should be brown, the apple should have a good color for the variety, the ground color should be white or creamy white, but not yellow, and the fruit should snap readily from the spurs. The proper time for picking is an individual problem for each locality and season, and the grower must determine it for himself.

The tendency in some localities of the Northwest has been to pick prematurely, while in other sections the opposite tendency is prevalent. It should be thoroughly understood that over-maturity is fully as detrimental to the keeping quality of fruit as immaturity. Apples that are over-mature at the time of picking have effected an almost complete change of the starches into sugar, and are that much nearer the end of their life. They could not be expected to last as long as fruit picked a week or two earlier and placed at a temperature that would greatly reduce the speed of the chemical changes occurring in it. The competition among the growers for high color in such varieties as Jonathan and Esopus (Spitzenberg) has often been carried on at the expense of their keep-

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ing qualities. The results secured with Esopus (Spitzenberg) last year are illustrative of the effects of this practice.

**ESOPUS (SPITZENBERG)
EFFECT OF OVERMATURITY.**


Per cent physiological and fungus decay at withdrawal from storage, and after a ten-day holding period under market conditions. The first pick was made September 25, stored September 26, 1913. The second pick was made October 10, and stored October 11, 1913.

DECAY

First withdrawal, January 12, 1914:	At with- drawal	10 days later
First pick	0.0	1.3
Second pick	2.3	2.3
Second withdrawal, February 19, 1914:		
First pick	0.0	1.3
Second pick	9.1	25.0
Third withdrawal, April 1, 1914:		
First pick	1.3	2.7
Second pick	4.0	26.0
Fourth withdrawal, May 4, 1914:		
First pick	2.7	6.7
Second pick	14.0	36.0

As can be seen, at the first inspection the difference in the two picks are very slight, but little decay occurring in either. At the second inspection, on February 19, which marks the usual limit of commercial storage for this variety, there was no decay in the first pick, made at maturity, and 9.1% in the second. Ten days later, or by the time the fruit would normally reach the consumer, the decay had increased to 25% (one-fourth of each box) in the lot picked when over-mature, and was only 1.3% in the lot picked at maturity. Considering the fact that the first pick was made before commercial picking for that variety could be said to have started in that particular section, and the last pick was made considerably before the last commercial pickings, it is interesting to speculate how much of the Esopus (Spitzenberg) from this locality was fit to use when it reached the consumers.

The temperature at the time of picking is a very important factor in determining the length of life of the fruit. If the temperature is high at the picking time, the fruit matures very rapidly. This was the case during the past season. An uncommonly mild fall has



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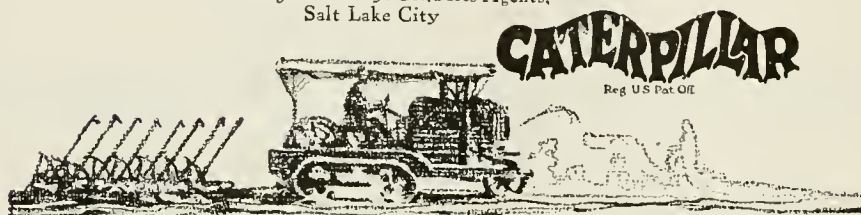
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caused the apples in many sections to mature far more rapidly than usual, and as a result much of the fruit is being stored at a more advanced stage of maturity than in the past. High temperatures affect the fruit after picking even more than during their life on the tree. It has been determined that apples mature as rapidly, if not a little more so, off the tree as upon it, if held at the same temperature in both cases. Therefore, unless the fruit is stored at a low temperature immediately after it is picked, its vitality and possible length of life will decrease very rapidly. Many growers pick the fruit at the proper time, but allow it to remain in the orchard for days, subject to alternate heating and cooling—conditions most unfavorable to keeping quality. Even after it is removed to the packing house it is often many days before it is packed and stored at the proper temperature. The effect of such delayed storage in contrast to immediate storage has been well brought out by the Department experiments. Boxes of fruit that had been picked, packed and stored within a few days were compared with boxes of exactly the same fruit, picked and packed at the same time, but delayed for two weeks before storing. This experiment has been carried on with a number of varieties of apples in the principal fruit sections of the Northwest for several years, so that approximately average results have been secured. The following table gives a summary of the results in four varieties:

IMMEDIATE VS. DELAYED STORAGE.

Three-year average for Esopus (Spitzenberg), Jonathan, Winesap and Rome Beauty. Percent of bad scald and of decay at withdrawal from storage, and after a ten-day holding period under market conditions.

	BAD SCALD		DECAY	
	At with- drawal	10 days later	At with- drawal	10 days later
<i>First withdrawal, January:</i>				
Immediate	0.0	1.1	0.1	1.1
Delayed	0.1	6.7	0.6	2.2
<i>Second withdrawal, February:</i>				
Immediate	0.6	9.6	2.1	4.9
Delayed	0.9	12.0	4.4	7.0
<i>Third withdrawal, March:</i>				
Immediate	5.2	12.7	3.9	7.1
Delayed	11.5	22.7	7.3	13.2
<i>Fourth withdrawal, May:</i>				
Immediate	10.3	20.0	4.7	12.8
Delayed	17.0	31.4	7.9	18.2

Note that ten days after the first withdrawal from storage, 4.1% of the immediate lot showed bad scald, as against 6.7% of the delayed lot, and ten days after the last withdrawal the difference is still greater, 20.0% of the immediate lot, against 31.4% of the delayed. The rate of decay showed similar differences at the same periods—1.1% of the immediate lots, ten days after the first inspection, and double that amount in the delayed lots, and ten days after the last inspection 12.8% in the immediate, with 18.2% in the delayed fruit.

This table needs little comment, for it shows plainly that at each of the inspections the amount of the deterioration was decidedly greater in the delayed storage lots, though, as previously stated, the delay began after the fruit had been packed. Undoubtedly if part of the delay had been in

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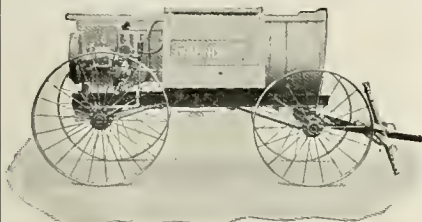
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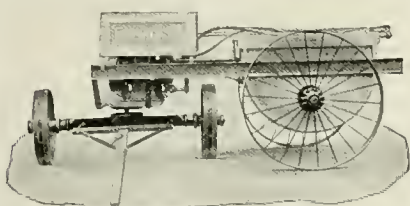
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the orchard after picking and before packing the amount of decay would have been greater.

It is a well-known law that with each increase of 18 degrees Fahrenheit, the rapidity with which chemical changes take place is increased from two to three times, or applying this to fruit storage, at 50 degrees temperature the chemical changes which ultimately result in the death of the fruit would occur at least twice as rapidly as at 32 degrees. Thus the conclusion to be drawn is plainly that the lowest temperature at which the fruit can be held without danger of freezing is the one most favorable to its length of storage life. Fruit has been placed by the Department of Agriculture in cold storage, part held at 32 degrees and part at 35 degrees, and the results were briefly as follows: The first two inspections, in January and February, showed very little difference in the amount of scald or decay in normally good-keeping apples held at the two temperatures. However, at the third and fourth inspections, made toward the end of their storage life, the fruit held at 35 degrees showed considerably more decay than that stored at 32 degrees. In apples with a shorter storage life the differences were shown even in the first two inspections. These results are additional proof to the effect that low temperatures retard the ripening processes, and that as these processes are quickened by higher temperatures the length of life of the fruit is shortened and its susceptibility to disease increases.

Even after many years of successful cold storage of apples many persons cling to the belief that cold-storage apples will not keep as well upon removal as apples that are held throughout at a higher temperature. The Department investigations give very conclusive evidence that this opinion is erroneous. Apples from the same lot, placed in and removed from cold and common storage at the same time and held after removal under similar conditions, practically always favor the lower temperature, especially if removed fairly late in the storage season. Apples held in common storage are usually removed by January or February, while those in cold storage are often kept considerably later. People are apt to compare apples removed from common storage early in the season with those taken from cold storage a good deal later, and this is obviously unfair. Apples held in any kind of storage until they are overripe will undoubtedly deteriorate very rapidly upon withdrawal to a warm temperature. Just as cold retards ripening in storage, a cool temperature is best for fruit when held for any length of time after its removal from storage.

In spite of what has been said regarding the effects of temperatures higher than 32 degrees upon the keeping quality of apples, every grower here doubtless realizes the impossibility of placing all of the crop in cold storage. At the present time lack of

Only a Car of Apples

(Continued from October issue.)

The Plot Thickens!

Bunco Skinner at Bat!

(By C. C. P.)

"Curr-r-r-r-ssses!"

It was B. S., the Proud Produce Pirate, who emitted this exclamation through his clenched teeth.

His musical voice trembled with suppressed emotion. His jewelled fingers nervously clutched a telegram, the contents of which had caused this outburst, for it said:—"Won't consign. Will only sell draft attached Bill of Lading. Ruggles of Red Gap."

But instantly B. S. recovered his wonted poise. Again he was master of the situation. In honeyed tones he called his private secretary.

"Here, Miss Keys, take a wire to this sagebrush rabbit—Ruggles of Red Gap: Answering yours, date, will buy any part ten cars extra fancy winesaps three dollars box delivered. Answer. Bunco Skinner."

Daintily lighting another of his private stock Turkish Cigarettes, B. S. leaned back luxuriously and soliloquized—"Guess the overquoting B. S. consignment racket is about played out, but I've got a trick worth two of that."

This absorbing story will be continued in our next.

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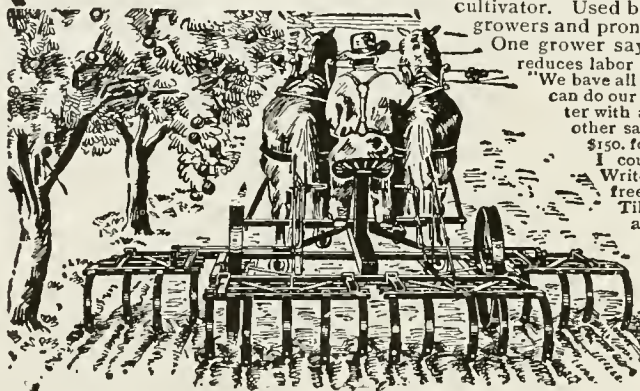
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storage space necessitates the shipping of great quantities of apples to Eastern markets throughout the harvesting season, with disastrous results to prices. With this state of affairs at present, and apple production on the increase certainly for many years to come, the question of finding storage space for the coming crops is one of the greatest problems confronting the fruitgrower of the Northwest. Cold-storage warehouses represent a large amount of capital in buildings and equipment, and also require a large operating capital. Some communities are justified in raising funds for a cold-storage plant, but many are not. It is nearly always possible, however, for a small community, a group of growers, or even one large grower to build a common or air-cooled storage house that will satisfactorily provide for their necessities. A common storage house of very large capacity may be built for six or eight thousand dollars, with slight operating expenses, as against fifty or a hundred thousand dollars and large running expenses for a cold-storage plant. Many common storage houses have already been built in various sections of the Northwest, and the Department of Agriculture has inspected many of them, held their fruit in several of them in the past, and has this season originated more extensive work with this type of storage.

Some of the common storage houses in the Northwest are well constructed and efficient, while others are unsatisfactory from many standpoints. Two essentials to be secured in the construction of a storage house are good insulation and an effective system of ventilation. Both of these are of utmost importance. A building must be well insulated to maintain a uniform temperature, and this is necessary if the fruit is to keep satisfactorily for any length of time. Even the briefest consideration of the details of construction and materials necessary to secure proper insulation would exceed the limits of my time, but it is highly important that the common storage be constructed to permit the minimum passage of heat or cold through its walls.

Ventilation is the next important consideration, and this may be achieved by simple air shafts, or more complicated systems, employing electric fans in the shafts. It is essential that outside air should not be admitted to the storage house when it is warmer than the air within the house. The owner of one storage house visited a short time ago was much distressed because his fruit was sweating. Upon investigation we found the ventilators all open, the electric fans in the shafts going, and the outside air, which was decidedly warmer than the air in the storage house, rushing in and condensing upon the cold fruit. This may serve to emphasize the necessity of constant and careful attention to the ventilators if the common storage is to be satisfactory.

Uniformity of temperature is a most important consideration in a common

storage house. It is better to hold the fruit at 40 degrees than to bring it down to 32 degrees at night and allow it to jump up to 45 degrees during the day. During the early part of the season, the temperature in a common storage house will probably remain relatively high, especially if cold nights are none too plentiful. This year the temperature in most of the common storage houses in the Northwest as late as the first of November was about 50 degrees. The daily receipts of warm fruit prevent the lowering of the temperature at a very rapid rate during the harvesting season. A greater effort should be made on the part of the grower to deliver the fruit to the storage house in as cool a condition as possible. Leaving the boxes of picked fruit in the orchard over night and hauling them to the storage house early in the morning would insure their arrival at low temperature. Fruit picked during the day and stored while still warm carries a large quantity of heat with it into the storage room, and when the boxes are stacked considerable time is required to reduce them to the temperature that they would reach if simply left in the orchard over night. After all of the fruit has been received it is a rather simple matter to reduce and hold the temperature at the point desired. Thirty-five degrees is about as low a temperature as most of the common storage houses maintain, but in some cases thirty-two degrees is reached and held. In either case, the length of time in the fall during which the fruit is held at a high temperature shows itself in the shortened life of the fruit. As mentioned before, early in its storage life an apple will show as little decay in common as in cold storage, but toward the middle of its storage life the difference becomes quite marked. In short, common storage may be as satisfactory as cold storage for fruit that is only to be kept until about the middle of the winter. Fruit to be held for longer periods should be placed in cold storage.

It seems entirely feasible to divide a common storage house into various compartments, each of which could be filled with fruit as rapidly as possible, and then held at a uniform temperature. This would render the common storage more nearly as efficient as the cold storage, but until some such plan has been worked out the preceding statements must hold.

In conclusion, let me say that although the experiments conducted by the Department of Agriculture along the lines indicated are by no means complete, and in fact in some directions, such as the investigations into common storage, can only be said to have begun, I have given only such results as are confirmed by the evidence of several years' work. In brief these are: 1. Most varieties of apples for storage should be picked at maturity. 2. Apples should have the least possible delay from the tree to the storage. 3. For cold storage a temperature of 32 degrees is usually the most satisfactory. 4. In the case of those varie-



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ties for which a short storage is desired, common storage may be made as satisfactory as cold storage.

The tables used are from "Cold Storage of Apples, with Special Reference to Conditions in the Pacific Northwest," U. S. Department of Agriculture Bulletin, to be published at Washington in the near future, and for a more full account of the results of the apple storage experiments, I would recommend this bulletin to your attention.

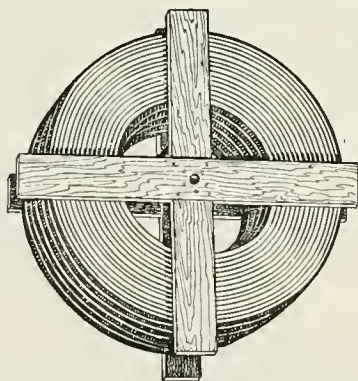
Trained Dairymen Employed

Every member of the classes graduating in dairying at the Oregon Agricultural College in the years 1914 and 1915, twenty-five in all, has taken employment in industries directly related to the work of his special training in college. The eighteen members of the class of '15 have employment in their specialties, largely as a result of the policy of the dairy department in placing its graduates in positions advantageous to themselves and to their employers. Six of the eighteen are employed as official testers in cow-testing associations. Three have found positions as superintendents of public institutions interested in dairying. Two are managing co-operative creameries. One is milk inspector in a metropolitan bureau of health. Two are butter makers in commercial creameries, and two are taking advanced work in college. Of these the manager of a large dairy ranch receives the highest salary, \$1,200 per year, with residence accommodations. Three others receive \$1,200 without accessories. Two receive \$1,000 each, and several receive \$750 each in money and their board and rooms, approximating as much more. The seven graduates of the 1914 class also receive satisfactory salaries in performing the work that the college trained them to do. By thus following the careers of its graduates and noting the degree of efficiency of their work, the college is able to determine the efficiency of its own work so far as those students are concerned. This situation rarely prevails in educational work, wherein the relation between the training and the later life work is a baffling problem. Those who support public education as well as those who make use of its opportunities are beginning to insist on an answer to this problem, which to a considerable degree is found in the data collected.

The British Columbia fruit crop,—peach and apricot,—show a considerable increase over last year, although in some districts leaf-curl has been quite extensive. The pear crop is about 25 per cent larger than in 1914; the plum crop about 90 per cent of last year; the cherry crop was larger than the 1914 crop and the apple crop is reported about 70 per cent of last year.

Southern Idaho expects to ship 1,500 carloads of apples this season (probably an overestimate. The greater proportion of these will be shipped from Payette, which will probably ship somewhere around 500 cars.

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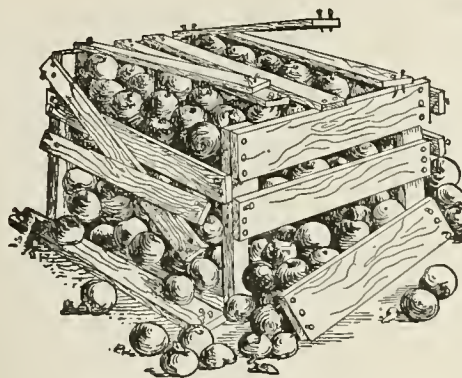
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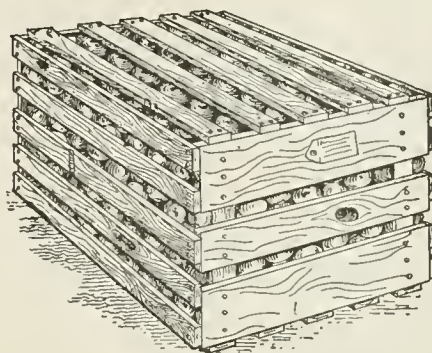
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Apple Marketing—Conditions Show Marked Improvement

[Furnished by Office of Markets and Rural Organization, United States Department of Agriculture]

THE marketing of the 1915 apple crop opens with more encouragement to growers and dealers than they found in the prospects for the 1914 crop. According to investigations conducted by the Bureau of Crop Estimates last reports show the condition of the crop to be approximately 80 per cent of the yield last year. The merchantable supply or commercial crop, as distinguished from total production, therefore, would appear to be approximately 40,000,000 barrels at the highest, whereas the commercial crop of 1914 is variously estimated as having been from

50,000,000 to 60,000,000 barrels. It is reported that, in the large areas where barreled apples are produced, the crop of early fall varieties is relatively larger than the crop of winter varieties. This would seem to indicate that within a very short time a considerable quantity of apples included in the bureau's estimates will be eliminated from consideration. Furthermore, it is said that the crop in some sections is seriously affected with fungus and blotch. To the extent that these defects prevail will the merchantable supply be reduced. Under these conditions, therefore, it would appear that the commercial crop of winter varieties may be considerably smaller than the total production the report would seem to show.

Business conditions show a marked improvement over last season, according to trade reports received by the Office of Markets and Rural Organization. The South, particularly, is in easier condition, and it is said that the United Kingdom and countries in the north of Europe will take liberal quantities. However, with reference to Europe, it is to be remembered that steamer space is in great demand. It is reported that all cold chambers are under contract with meat packers until the first of the year, and ordinary space is said to be more limited than in 1914. In shipping circles it is maintained that Europe may not be expected to take the same quantities as last year. According to trade reports the abundance and cheapness of apples during the past year will be reflected in a satisfactory consumption this year. In other words, it is thought that the habit of eating apples may be expected to hold over from last season. However, one or two correspondents maintain that the conditions of one season do not affect the next insofar as consumption is concerned.

It is generally reported that abundant storage space will be available and that comparatively there will be no great difficulty in financing the movement of the crop. Conditions for liberal consumption are said to be good in most markets, and altogether there is a de-

cided feeling of optimism on the part of those concerned, as compared with absolute gloom this time last year. It is to be remembered, however, that 40,000,000 barrels of merchantable apples, which is thought to be the maximum estimate for this year, is a goodly supply, and that to assure a steady normal movement throughout to the conclusion of the season next spring, large quantities must pass into consumption between now and the first of the year. Unreasonably high prices at this time will mean a curtailment of consumption and the storing by the growers of

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larger quantities than the conditions might justify, with the result that later on they might receive net prices below the level of opening values. By this it is not meant that growers ought to sell now for less than market value, nor is it meant that buyers are to be encouraged in depressing opening values. The outlook is normally encouraging for satisfactory profits to all concerned if good judgment is used, and it is meant to urge upon growers and dealers alike the advisability of breaking deadlocks with reasonable concessions on the part of all. Arbitrary ideas of values should be avoided, so that the movement of the crop may proceed in a healthy way. Unfortunately, when the demand for apples is good, many growers and packers seem to feel that poor grading is justified, and in such years there is a tendency to lower standards. Attention is called to the fact that no condition can justify anything but an honest pack. For a poor grade and shoddy pack the producer ultimately must pay, although temporarily the packer may receive an advantage. Apples should be sold for just what they are, according to the recognized grades. Whether or not the price may be high, growers and dealers alike should adhere strictly to that policy.

Under all conditions there are certain fundamental processes that ought to be observed in preparing the crop for market if success is to be assured. The fruit should be picked and packed in such condition as to insure it against abnormal deterioration. With perishable varieties having a long ripening season it is suggested that growers should not attempt to harvest the crop at one picking, but rather should glean the trees for only such fruit as is ready to come off, repeating the process until the crop has been picked in uniform condition. The advantage is that the



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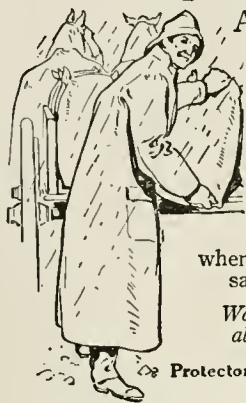
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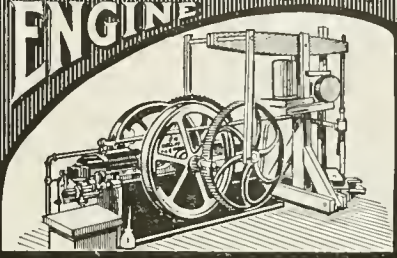
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shipping period may begin earlier and last longer, thereby securing greater time for effecting distribution. Furthermore, if all the fruit is harvested at the same time, it is to be remembered that shipments represent extreme stages of maturity, ranging from ripe to green in the same package, and that frequently toward the end of the season overripe condition of a portion of the crop may result from failure to pick first only what is in condition for marketing. Careful handling from tree to car is necessary to prevent deterioration. It is not difficult to understand why a lot of fruit does not arrive in the market in prime condition if it is picked and piled on the ground in the hot sun, placed in packages in a heated condition, and finally hauled in wagons without covers or springs over rough roads. With proper facilities, apples picked on hot days should not be packed until the following day. For this purpose shelter should be provided in order that the fruit may be packed in a cool, dry condition. Growers who have no packing sheds should either build them or arrange to use their barn floors. Wagons should be equipped with springs and covers provided for the protection of the fruit from the weather. Culls and cider stock should be eliminated from the better grades and as far as possible diverted to cider mills, canneries and evaporators. While in short-crop years there is a fair demand for low-class apples, still by filling the autumn markets with poor stocks it is possible to obstruct seriously the disposition of the standard grades, and force into cold storage larger quantities than the conditions may justify. In general, only long keeping, standard pack apples should be placed in the coolers, though it is frequently profitable to store for relatively short periods such sorts as Grimes, Wealthy and Jonathan, for withdrawal during autumn and early winter as the demand justifies. In packing fruit for storage special care should be exercised to pick the fruit in sound condition, pack it carefully, and rush it into storage without delay. Such methods add materially to the life of the product.

Owing to geographic location, some important apple-producing states have the natural advantage of an early season. It would be folly for such states not to profit by that advantage. It is possible for growers so situated to leave their crop on the trees until the period of greatest movement, and frequently in years past they have suffered great loss by doing so. The Southern states of the apple belt should begin early and market the greatest portion possible prior to the period of greatest movement, and thereby avoid competition with the producing areas of the northern belt. On the other hand, states that go to market latest should be in no hurry to rush the markets during the period of greatest movement. In brief, the crop should be distributed throughout the longest time possible, cold and dry storages being judiciously utilized for conservation. Small towns outside

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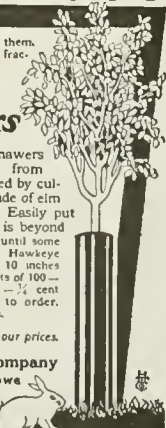
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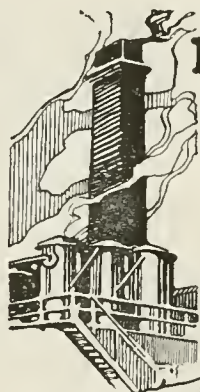


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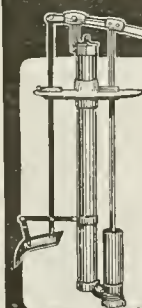
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of the apple belt are often poorly supplied, even in large crop years. Growers of the Middle West have taken advantage of this condition by going to such towns with cars of apples and selling on the track. In order to succeed with this method the shippers should know conditions of supply and demand in the town selected, ascertain the railway and township regulations controlling track sales, and precede delivery of the car by judicious advertising. The mayor can give information as to whether a license is required, and the railway agent as to whether track sales are allowed. Insofar as the apple grower is concerned, co-operation in distribution and marketing is highly commended as an economic system for securing judicious handling. Of course it would be impracticable for growers to organize upon the eve of crop movement, because disaster would likely result as the consequence of too little time for perfecting business arrangements. However, in communities where co-operative packing and selling agencies are operated, the growers should do all possible to strengthen such exchanges with their patronage and counsel. The disloyalty of members is the chief element of failure in co-operative circles, and apple growers are strongly urged to stand by their associations as the best way to solve the problems that are common to all.

Apple Anthracnose or Black Spot Canker

This disease is known to occur on the Pacific Coast west of the Cascade Mountains in Oregon, Washington and British Columbia, and has more recently been reported in the south central part of Washington in the Columbia River Valley. Frequently it is the matter of inquiry by orchardists in the eastern and central parts of Washington. In

THE COST

is given on page 4.

There are also other points of interest to orchardists.

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order to acquaint the grower with the nature of the disease, its effects, and methods of control, the following statement is issued by Mr. D. C. George, assistant plant pathologist of the Experiment Station at Pullman:

Apple anthracnose, or black spot canker, manifests itself as a twig and branch canker on the apple and pear, and as a storage rot on the fruits of the apple and quince. The twig and branch form appears as dark colored, sunken areas or cankers in the bark of the younger growth. It is especially injurious on branches under two or three inches in diameter, only occasionally being found on the thick bark of the larger branches. Frequently several of these cankers coalesce and completely girdle the branch. Young trees are sometimes killed by this girdling. The young cankers begin their development in the fall, usually about the first of November. They appear on the bark as small circular spots, reddish brown to black in color. Beneath these spots a water soaked appearance is noticed, which extends to the cambium layer. During the winter months development is retarded, but becomes vigorous with the renewed activity of the host in early spring. As the spots enlarge they become elliptical in shape, more or less depressed and smooth, and the bark dries and slightly cracks at the advancing edge. The cankers are mature in size by the last of June or a little later and vary from one-quarter of an inch to six inches in length by one-quarter of an inch to five inches in width. About this time small elevations or pustules, more or less conical in shape, appear in the cankered area. Later, about midsummer, these pustules crack open and expose the spore-bearing mass of fungous tissue. In the late autumn the cankered area is separated from the healthy tissue by a slight ridge due to the formation of callus. When the



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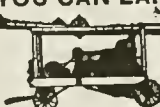
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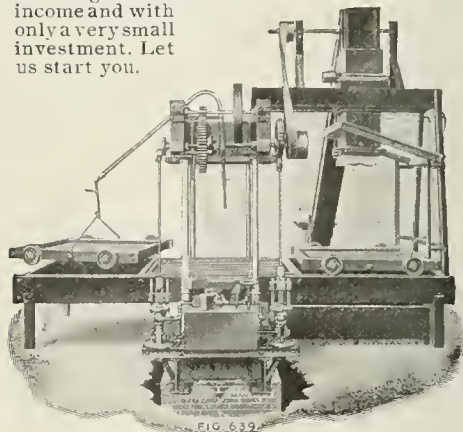
canker becomes old, usually the second year, the bark cracks away from the edges, becomes loose and drops out, leaving unsightly scars. As stated previously, the disease is known to cause a storage rot of the fruit. It first appears on the surface as small, light brown, circular spots of rotting tissue. These spots generally enlarge and later change to very dark or black, eventually becoming dry, depressed and rather tough. Pustules similar to those formed in the cankers soon develop, quite commonly making their appearance in concentric circles.

Anthracnose is caused by a parasitic fungus known as "Neofabraea malicorticis." It produces two kinds of spores or reproductive bodies. The summer spores, or conidia, are formed during the first year of the development of the canker. They are mature by late summer or fall and are ejected in a gelatinous mass from each of the small pustules found on the cankers. These spores are readily separated by water, rain, dew, or certain summer sprays serving as agents in this respect. On being liberated they are scattered by various agencies and each one is capable of producing a new infection. The winter spores, or ascospores, are developed the second year, within small club shaped structures borne in disk-like bodies that occupy the position of the pustules of the previous season. Following the fall rains these spores are discharged with force and are carried away by the wind. Like the conidia, upon germination they are capable of producing new infections. It has been found that conidiospores are also developed from old layers around the edges of the pustules producing the ascospore stage and also in the bark of cankers three years old. If the bark drops to the ground at the end of the first year, the winter spores may be developed in such bark on the ground.

Thorough spraying and pruning are essential in order to control the disease. The spraying should be done immediately after the fruit is picked, as at this time the spores are most abundant and new infections most likely to take place. The 6-6-50 bordeaux is recommended. If the fall rains begin early and the trees are harboring old cankers an additional spraying about three weeks later is advisable. Too much emphasis cannot be placed on thorough pruning. It is advisable, where possible, to do this before the first spraying. All small twigs and branches showing any signs of the disease should be removed. Old cankers on the larger branches should be cut out without fail, as they are very serious sources of spore production, and the wounds should be protected in order to keep out wood-rotting fungi and insect pests. The cut edges of the bark and the cambium should be painted with shellac, and as soon as this dries the entire wound may be covered with coal tar or any good paint. The prunings and all bark removed from the cankers should be burned.—Washington State Experiment Station Bulletin.

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Cider may be kept either perfectly sweet or with whatever "bead" the taste of the user suggests, according to Miss Carrie Pancoast, of the Missouri College of Agriculture. It may be canned immediately or allowed to stand for a few days, but in either case the method used includes filling fruit jars with the cider and adding a tablespoonful of sugar to each quart, if desired. Place the rubber and top in position and tighten partially, in case of glass jars; or if tin is used, cap and tip the cans. An ordinary washtub or similar vessel may be used in sterilizing. Laths or thin boards should be laid across the bottom to avoid heating the glass to rapidly and cracking it. Put in water enough to fill the vessel an inch or two above the jars, heat to boiling, put the jars in, and let the boiling continue for ten minutes. Then remove, tighten the covers, and invert in order to test the lids while cooling. Other processes that may be used involve sterilizing for eight minutes with a water seal outfit, for four minutes under five pounds' pressure with a steam pressure outfit, or for two minutes with an aluminum pressure cooker.

Winter Injury to Fruit Trees.

A great many inquiries have come to the horticultural division of the Experiment Station asking for information about treatment of winter injured trees. There are two forms of winter injury more common than others. In the first the bark is killed directly, and it often splits on the trunk and larger limbs and turns dark brown on the smaller branches. The surface bark on the small limbs is often raised, as if blistered. This may occur in small circular or irregular areas, or the entire limb may be affected. The small limbs

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should be cut away and the split bark covered with grafting wax or bound down with strips of burlap or cloth. This should be done as soon as the injury is noticed. The second form of injury is usually not noticeable until growth starts, unless the inner bark is examined. This is usually yellow or light brown. The growth of the tree is late in starting and then the side buds develop only small, slender leaves. The side buds on the previous summer's growth of wood often fail to start growth, or after starting die before the first leaves unfold. The bark often remains green through the summer and dies the following winter. All branches that fail to start, and those that make a very poor growth, should be cut away early in the season. The best cultivation and care possible should be given to enable the tree to recover normal vigor. Excessive pruning often does more harm than good. Plant some crop in the orchard in midsummer, or cease cultivation and irrigation early enough to cause the trees to thoroughly ripen their wood before cold weather occurs. —Washington State Experiment Station Bulletin.

Coming Events

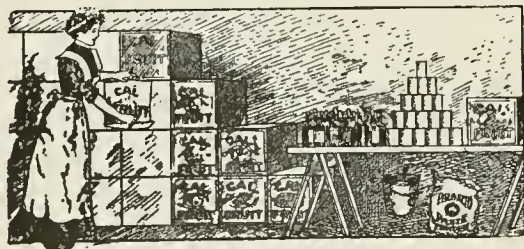
Arizona State Fair, Phoenix, Arizona, November 8 to 13.

Cascade International Stock Show, North Yakima, Washington, November 22 to 27.

Lewisston Livestock Show, Lewisston, Idaho, November 29 to December 4.

Pacific International Livestock Exposition, North Portland, Oregon, December 6 to 11.

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BETTER FRUIT

VOLUME X

DECEMBER, 1915

NUMBER 6



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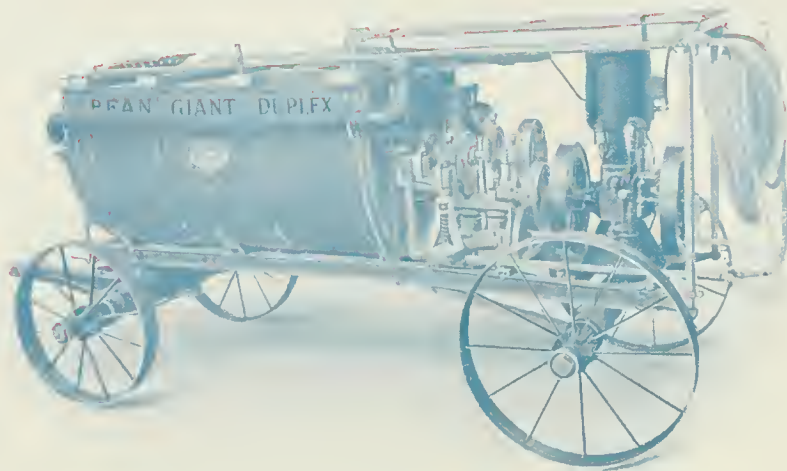
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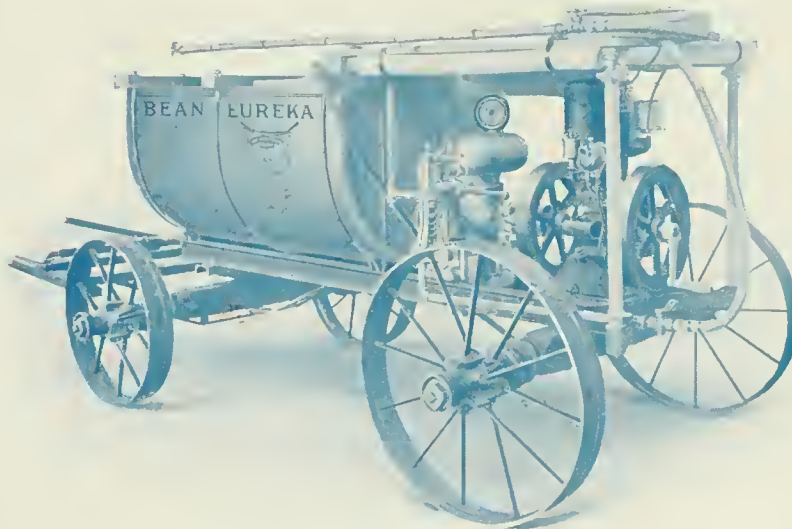
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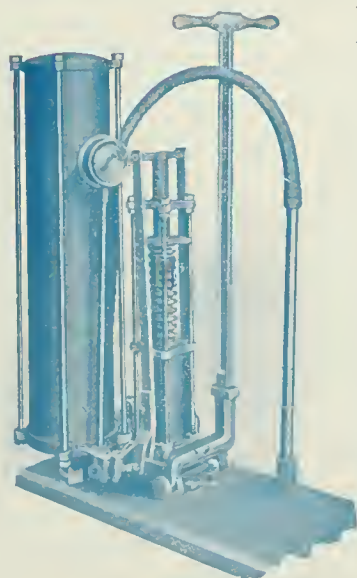
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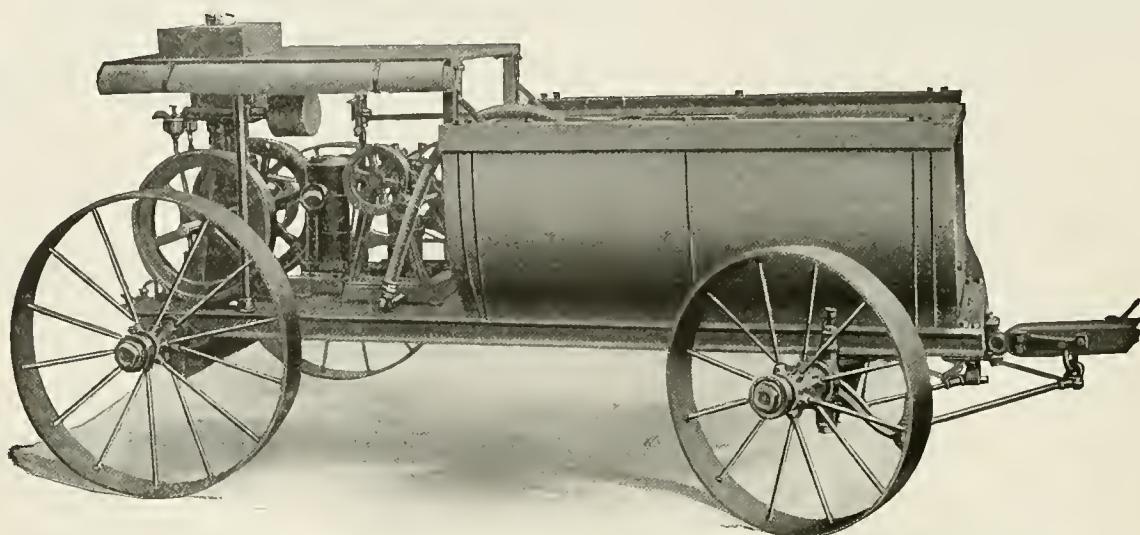
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Application of the Principles of Pruning to Young Trees

By Professor C. I. Lewis, Oregon Agricultural College, Corvallis, Oregon

(Continued from last issue.)

At the time the tree is given its first pruning we should definitely settle the question of height of head. Most growers, after they have headed the tree, pay no more attention to it until the following spring, when they are ready for the second pruning. We believe, however, in many cases this is a mistake. It will be found very advisable in May and June to go through the orchard and look over the young trees carefully. At this time certain very small shoots or buds should be rubbed off. If one branch is growing at the expense of all the others, it can be suppressed, and one can do very much the first year to start the tree in the proper way and to put it in better condition for the second year's growth. It is only in rare cases that it will be advisable to give the trees a systematic summer pruning the first year, because it will be only occasionally that the trees will make a sufficiently rank growth to warrant such pruning. Many young trees do not make much top the first year; they are building roots and getting firmly established. In cases, however, where they have made a strong growth, it is suggested that the trees be summer pruned, and just as soon as they have made sufficient growth so that new laterals can be formed to advantage, you should pinch back these shoots, provided this pruning can be done not later than the middle of July, and preferably in June. These laterals should be cut back to stubs from 8 to 15 inches in length, depending, of course, upon the vigor of the branch. One can make the mistake, however, of pinching them back so hard as to force the new laterals too near the main crotch, and thus make a very close, heavy crotch which will pile up in years to come.

Since few trees can be summer pruned the first season, we shall consider the tree the second spring, as one which had received no such pruning. One should choose definitely the type of tree to be grown, either the open, the leader or the modified leader tree. If the tree was summer pruned, that question should have been settled at the time of pruning. If you grow the leader or modified leader you will choose one branch to maintain the lead, and will prune this in such a way that it can maintain such a lead. If you decide to grow the open tree, you should choose the four or five branches and space them as far apart as possible and cut these back according to their

strength, cutting the strongest branches the most and the weakest ones the least. One will then have five main branches with a few laterals on each one. It is customary to remove all these laterals. By the middle of June the young tree should have made a sufficient growth to allow for summer pruning. Each branch should be pinched back so as to leave it from 8 to 15 inches long, cutting according to vigor, always suppressing the stronger.

By the following spring each of the original five main scaffold limbs will

have from one to a dozen lateral or additional branches. It is customary to remove all but one from each main branch so that when the tree is pruned there will be ten branches on the tree where there were five before. A great deal of care should be used in selecting these new branches. The two branches on each scaffold limb should be spaced as far apart as possible. Of course, avoid the choosing of laterals which will tend to grow in toward the center of the tree. Then in cutting these two laterals avoid cutting them equally.



FIGURE 32—Five-year-old Winter Nelis pear tree begun as an open center, but typical of the leader type. The lower branches are not keeping pace with the upper and are becoming weak in comparison. To save or restore balance the upper branches must be suppressed.



FIGURE 33—At left: Typical five-year-old Winter Nelis. At right: Same tree after pruning. Note that the center is being suppressed. This tree gives indication of bearing a crop, and if it should will stand heavier cutting back next season.

Choose one which will grow as a leader for the branch and do not cut this back as heavily as you do the second branch, which you will suppress more heavily in order to make it grow as a side branch and not as a main branch. In this way you will get rid of the weak crotch, which is one of the fundamental principles to remember in pruning trees. This second summer these trees should be so well established that by June you can give them a second pruning. Each one of these branches that you left on the tree has grown 15 or 18, or in some cases as much as 30 inches or even more in length. We would advise, instead of letting them go the entire summer, that whenever they have made sufficient growth they be cut back in order to force out a new set of laterals. The following spring in all probability about all the pruning you will have to do will be a little thinning out here and there, and in case the laterals which come out as a result of the pruning in June have made a very vigorous growth and are getting too rangy, you will have to cut them back somewhat, although it will only be in extreme cases that you will have to practice much cutting on these branches. Moderate clipping back is often advisable to prevent the terminal bud from continuing growth and producing long willowy growth. So you continue this pruning right along for two or three years, never leaving as a rule more than about two branches where you had one before.

At the beginning of the fourth year I would suggest a modification of the pruning. It is coming time now to let down on the heavy pruning. If you practice as severe pruning as you did

the first four years, you are constantly going to force the tree into wood. Many growers thin out the laterals excessively, force an enormous terminal

growth and cut back this terminal growth vigorously, thus forcing out new laterals. We believe that too many growers make a mistake by pruning too vigorously at this time. It would be to advantage to leave more lateral wood than most growers leave. Just how much is advisable to leave in all cases is very hard to say, because we have not worked out definitely just what is the relation of shade to the formation of fruit spurs or fruit buds. Until that can definitely be worked out it won't be possible to give very explicit directions, but we would rather let the tree grow a little brushy, because after it comes into bearing this excess wood can very easily be thinned out. The summer pruning now changes from the former early summer pruning and should now be done at the time the terminal buds form, rather than early in June as already described under summer pruning. The rule, then, with trees from four to seven years of age, is simply to cut back the terminals sufficiently so they will not run away with the tree, and just thin out so that the tree does not become too dense. More pruning than this we would not recommend. We feel that if this is followed there will be a tendency for young trees to come into bearing earlier than they otherwise would.

The amount of pruning that trees which have just come into bearing will stand will, of course, vary tremendously according to their vigor. The



FIGURE 31—At left: Five-year-old Winter Nelis showing one branch growing at the expense of the rest of the tree. At right: Same tree pruned. Note that the strongest branches have been cut the hardest.

soil they are on, the climate and the variety should all be taken into consideration. As shown in the chapter on "The Study of Fruit-Buds," there is a great difference in the bearing habits of trees. The amount of pruning which regular bearers like Jonathan, Wagener, Winesap, Grimes, etc., will stand will vary considerably as compared to the pruning that Yellow Newtown, Northern Spy, Baldwin, Tompkins King or varieties which have their habit of growth will stand. As a general rule, the growers of Yellow Newtown on the heavier soils of the state are making a mistake with their young trees. In almost all cases they are over-pruning, and are cutting their trees so hard that whatever tendency the trees might naturally have to bear are directed into other channels.

The directions given so far have been written chiefly from the point of view of apple pruning. Nevertheless the recommendations apply equally well to all of our deciduous fruits and nuts, such as prunes, pears, cherries and walnuts. There are a few special recommendations, however, that we wish to give for fruits other than apples.

Special Recommendations for Pears

We never recommend pruning the pear to the leader type. Growers generally feel that it is harder to fight the blight with the leader than with the open type of tree, so we generally recommend that either the open type or the modified leader be chosen. We would caution growers, however, that many of the open trees are very easily

damaged from blight and are often ruined because the crotches are poorly formed. An effort should be made to have the branches spaced as far apart as possible, so that if a branch is lost from blight the remainder of the tree can easily be saved. It should always be borne in mind that fire blight works in succulent growth, and that in handling pear trees one should avoid excessive wood growth. Pears begin their growth earlier in the spring and cease it earlier in the summer than is the case with apples. This should be specially borne in mind with young trees if summer pruning is to be practiced. Some varieties of pears, especially the Bartlett, have a tendency to form fruit buds and to bear fruit on the ends of the terminals. They will do this quite often while the trees are still very young, and they should be discouraged from bearing in this way. The tendency to bear on such terminals should be overcome by summer pruning. The crooked growth of the Winter Nelis and Bose is very troublesome to the beginner in pear growing. Our advice would be not to worry too much about the crooked growth, for as the trees become older they will take care of themselves very largely, and this crooked growth will cease to be troublesome. Prune the trees in practically the same way as those that grow straight.

Pears can carry more lateral wood than apples. They relatively spread farther when they produce a heavy crop, so that one should avoid thinning the young trees excessively. Keep



FIGURE 36—Typical cherry tree of extremely poor type, all of the main branches issuing at one point. Note how leggy the tree is, due to the fact that there was insufficient heading-in the first two years. Heading this tree back twice a year might have been helpful.

all spurs or fruits from the main trunks and low down on the scaffold branches, as these are a source of infection from the blight. It is also wise in pruning in any district where fire blight is troublesome to see that the pruning tools are carefully sterilized before the cuts are made.

Special Recommendations for Cherries

Formerly the cherry was headed about 35 inches. There are many growers in the state now that practice heading from 20 to 25 inches, who are building very nice trees. There seems to be a prejudice against pruning a cherry tree. Our advice would be to prune it the first six years just about the same as has been directed for apples. We would urge, however, the summer pruning, as we have felt that splendid results could be obtained with cherries by summer pruning. The cherry has a tendency to shoot up in the air very rapidly, making an enormous growth the first two years. The result is that the average grower has not the nerve in the winter to cut this back severely, and he leaves his trees too leggy. One way to overcome this leggy, high type of growth is to cut back the terminals in the summer. A very good type of tree to get would be the Mazzard body, making the trunk and main scaffold branches of the Mazzard, later budding these over. This will give a stronger crotch and there will be less gumming and loss from trees of this type. Should your cherry trees need heavy cutting, do not hesi-



FIGURE 35—At left: Five-year-old Bartlett pear tree before pruning. At right: Same tree after pruning. This is a splendid type of modified leader.



FIGURE 37—Three-year-old English walnut tree properly staked. The pruning of these trees should consist, first, of the removal of two lower laterals, and second, the cutting back strongly of last year's growth. This tree was headed at thirty inches. It would have been better to head five inches higher. The alternate trees are three-year-old cherries, which were summer pruned the previous season. Note how much stronger and better spread the trees are than the cherry tree shown in Figure 36.

tate to take out large branches. However, you should take care to protect the wounds carefully, as cherry wood is softer than that of most of the pomaceous fruits.

Special Recommendations for Prunes

There is very little additional that can be said which will be helpful in the handling of young prune trees. The recommendations for the apple trees apply very closely. The trees are generally headed higher than any of our other fruits, 30 to 35 inches. Some growers, however, are heading about 20 to 25 inches, and we have seen some very pretty trees headed at this height. The tree never becomes extremely high headed, and since most of the fruit, which is to be evaporated, is allowed to drop on the ground before harvesting, the height of head from the harvesting point of view does not need any consideration. However, we believe that the growers will get better results by constantly suppressing terminal growth and thinning out the centers where they become too dense, so as to allow development of strong wood. Do not overdo this, however, by removing all small laterals, spurs and secondary branches. We would urge, also, that not too much wood be taken from the outside of the tree, and that it be kept fairly open. Many growers of young trees practice cutting off considerable wood on the outside of the tree and leave the centers a little dense. We would recommend just the reverse of this policy. Try to keep the trees low headed, broad and spreading, so as to build a large framework for fruiting wood in succeeding years.

Special Recommendations for English Walnuts

We would recommend that the trees be headed at about 35 inches, and at the time they are headed that a good heavy stake, 7 or 8 feet in length, be driven

down close to the body of the tree. The first summer choose the four or five laterals that will give a good scaffold framework and tie these to the stake. If you do not do this they will tend to droop to the ground too much, but by careful tying you can keep them well in shape. The following spring cut back the trees exactly as though they were apples. We find in many walnut trees that one branch may grow up six or eight feet. It may grow three or four feet higher than any of the other branches. Cut this one back hard so as to bring on the other branches. We generally recommend the pruning to be done just before the starting of the sap flow. Formerly the trees were allowed

to grow three or four years and all laterals were taken off and the trees grown to poles. We find that when they are handled as though they were apples we get a more spreading tree, one with larger fruiting area and one which will be much more easy to handle from the orchard management point of view.

Special Recommendations for Peaches

The peach has an entirely different fruiting habit from any of the other trees we have mentioned. The fruit is all borne on the one-year-old wood. However, the aim in pruning such trees the first few years is very much the same as that for other types of fruit, namely, the building up of a good, strong framework for future years of fruiting. The peach when it is secured from the nursery is generally too large and has a large number of branches. An ideal tree would be a straight whip, but it is almost impossible to buy such trees, and under our soil and climate conditions they tend to grow very vigorously in the nursery. We would recommend a general heading to about 18 to 20 inches. If whips can be secured they should be pruned as is customary with other trees. If there are a few weak laterals we would recommend their removal, but if the trees have strong laterals, instead of removing all the lateral growth, which is practiced by some growers, we would advise choosing half a dozen well-spaced branches and cutting them back to one or two buds. This will give a larger leaf surface the first year, will remove the danger of having a tree stand with only one or two branches, and also will remove much of the danger of the trees dying. We have found that under our climatic conditions a great many peach trees, when they are pruned back to whips after they have once formed strong laterals, never start to grow at



FIGURE 38—This illustrates two methods of pruning the English walnut tree. The trees pruned to "fishpoles" at A.A. are exactly the same age as tree B, the only difference being that on trees A.A. all lateral growth has been kept off for several years, the trees being given summer as well as winter pruning to remove laterals, while with tree B all laterals have been allowed to remain.

all. Some trees will force out new buds and shoots, but on the other hand there are others which will not. If after the buds start on the short laterals there are found to be too many, it will be a simple matter to thin out undesirable growth. It is customary to try to head the peaches as low as possible; to have the first branch come out very close to the ground and to get the crotches as well spaced as is consistent with the amount of area one can work with. At the end of the first year choose four or five of the best-spaced branches and cut them back on an average of 8 to 12 inches in length. Not much summer pruning is practiced for peaches. By the end of the second year the tree should be cut back again so that it will vary in height from about 3½ to 4½ feet. Constantly train the tree to spread by cutting to outside buds, constantly forcing the tree to make a broad-spreading top rather than to allow it to shoot up in the air. It takes more nerve than the average grower has to cut the trees as hard as indicated, but it is necessary if one is to keep the tree near the ground and have a profitable fruiting tree. It will be necessary to cut off about two-thirds of the last year's wood from the inside of the tree. Practice this constantly with the peach. The aim will be to keep the center completely open so as to give light and develop strong wood. Cut out all weak wood and limit the amount of annual wood so that what is left can grow strong. It will be only on the strong wood that large peaches will grow. We would caution the growers, however, that they can go to extremes in growing

vigorous wood. If the wood becomes too vigorous, the first few crops will be borne entirely on the ends of the shoots, and it will be almost impossible to prune the trees and still have any fruit. The medium-sized wood will be

more desirable. If you find the wood is getting too vigorous be sparing in the pruning and it will tend to check the trees. A little summer pruning might be used to advantage where the wood tends to become excessive. Not much fruit should be taken off peaches until about the fourth year.

California, according to the California Fruit Distributors, shipped the following tonnage in the year 1915. The figures also show the tonnage for 1914, showing the shipments this year were somewhat less than last year. The figures given are in carloads:

	1914	1915
Cherries	166¾	205¼
Apricots	382	392¼
Peaches	2,144	1,688¾
Plums	1,906½	2,224½
Pears	2,685½	2,608
Grapes	7,116¾	7,201½
Miscellaneous	43¾	42¾
	14,444¾	11,363

The National Conference on Marketing and Farm Credits will hold a meeting in Chicago at the Hotel Sherman November 29 to December 2, inclusive. The first meeting was held two years ago. An immense amount of good has been accomplished through this conference. Every fruit grower, every farmer and every one engaged in marketing farm products should not fail to attend this conference if it is possible to do so.

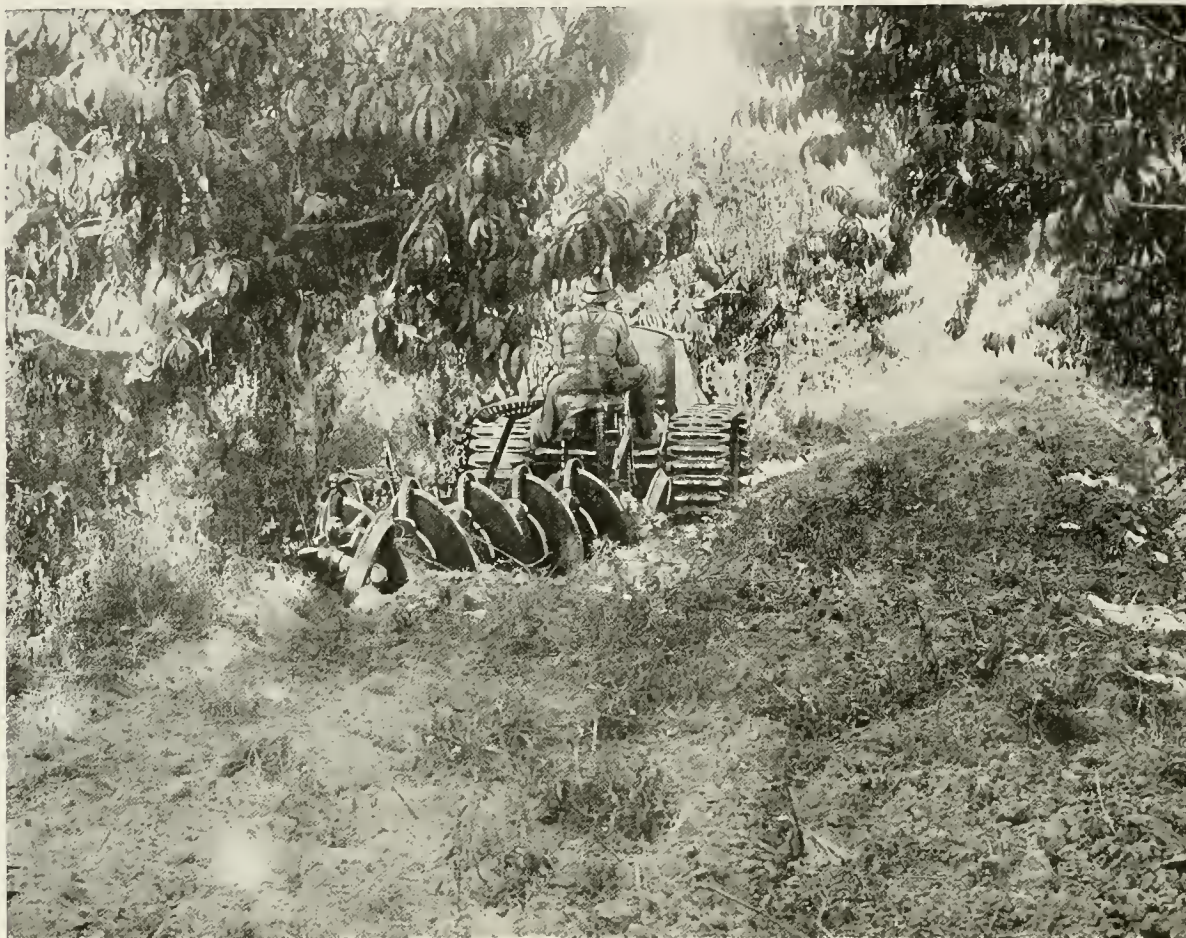
The first returns from Watsonville Newtowns exported are not very flattering in net results to the grower.



FIGURE 40—Same tree as shown in Figure 39, after pruning, showing desirable heavy pruning.



FIGURE 39—Young peach tree just coming into heavy bearing.



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Economies in Apple Harvesting

E. H. Shepard, Editor and Publisher of "Better Fruit" and Fruit Grower, before the Washington State Horticultural Society and the Oregon State Horticultural Society.

A FEW years ago apples commanded such a high price, with a ready sale, that economy in the orchard industry was very little thought of. As a matter of fact, the fruitgrower could make money no matter how great his expense. "Necessity is the mother of invention." Therefore in these last few years when low prices have prevailed, with no immediate prospect of higher prices, fruitgrowers have realized that in order to make money it would be necessary to reduce the cost of production both in growing and harvesting. Originally it was my intention to include in this address something on economy in growing and cultural methods, but inasmuch as Professor C. I. Lewis, horticulturist at the Oregon Agricultural College Experiment Station, has just recently issued a bulletin on "Economics of Apple Orchard" in which cultural methods are discussed so thoroughly I hardly think it necessary to take up that phase of the business, as time is limited. But I do want to say that Professor Lewis has contributed to the orchard industry in his bulletin, the most valuable, complete and thorough,—in fact, the only thorough treatise on the subject of orchard economies that it has ever been my pleasure to read. As your program is unusually long I shall endeavor to be brief and therefore proceed without further discussion upon the subject assigned to me—"Economics in Harvesting the Apple Crop."

Thirteen years ago I became a fruitgrower in Hood River Valley. When I produced 1200 boxes the harvesting season lasted from the middle of Octo-

ber until Christmas time. This year I harvested over nine carloads in thirty-four days. A few years ago the cost of harvesting a box of apples approximated 50 cents per box in most cases. Wiping and grading cost anywhere from 10 to 20 cents per box, and every other expense connected with harvesting was proportionately high, but gradually the expense has been reduced. A few years ago I published an itemized cost on the harvesting expense which set the ball rolling, and since then we have been furnished with many figures on the cost of harvesting, each year showing a reduction in this cost. Four or five years ago I asked one of our prominent growers what it cost him to pick, how much it cost him to grade, to pack, etc., and was surprised at his reply: "I do not keep costs on these different items; I cannot answer your questions, but I know it costs over 75 cents to grow and market a box of apples."

It is a well-known fact that many large manufacturing concerns have been restricted in the price they can sell at by competition. With no prospect for increasing the sale price, their only opportunity of making money on the investment was through efficiency and economy in production. The fruitgrower today is facing the same problem—economy and efficiency in the growing and harvesting costs. No man in a manufacturing business or any producing business,—be it either growing apples or producing anything else,—is in a position to reduce the cost of production unless he knows the cost of every item of production; he cannot

not reduce the costs if the costs are classed under one general head of costs. Therefore, several years ago, with the aim in mind of reducing the cost of production, and more particularly the harvesting cost which I am discussing today, I divided the harvesting costs into twelve separate items which, in my opinion, is a sufficient itemization of the costs to enable the grower to ascertain where the expense can be reduced. This classification of harvesting costs is as follows: Packing, picking, grading, making boxes, orchard hauling, hauling to the depot, help in the packing house, hauling empty boxes to the packing house, nailing up, boxes, paper and superintending.

First, I desire to make one general statement and then I will proceed to explain in detail. Last year I saved 4½ cents per box over the previous year, and this year I saved 4 cents per box over last year. Two years ago I thought I had nearly approached the minimum; last year I felt quite sure I had, but by careful work, as already stated, I succeeded in reducing the cost of harvesting 4 cents this year, compared with last year. My saving this year is more largely through efficiency than in lower costs. This will be evident to you when I tell you that I marketed two carloads more this year

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other without lifting
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than last year, in three days less time, with one man less in the harvesting crew. With my present facilities, which are limited. I have no hesitancy in making the statement that I could harvest at least double the quantity or more, in the same length of time as I harvested the crop this year, at a less cost. My packing cost was 4 cents per box. A few years ago we paid 7 cents per box for packing. A packer is entitled to as fair wages as any other first-class worker. What he earns depends upon the number of boxes he is able to pack. This quantity can be decreased or increased by the facilities afforded him. Therefore, it is economy to provide the packers with convenient room, good light and all necessary facilities for efficient and speedy work.

On account of low prices last year, not feeling able to spare the money to

build a packing house, I went down to Portland and had the Portland Tent and Awning Company make me a tent 30x40, the top made of 12-ounce duck and the sides of 8 ounce. The top and sides were sewed together in one piece, and the ends were made separately of 8-ounce duck. The sides and ends were 8 ounce instead of 12 ounce, reducing the cost of the tent. Instead of having the tent made as tents are usually made, with the ends, sides and tops all in one piece, I had the top and sides made in one piece, the top and sides being nothing more or less than one big sheet, and the ends separate, which makes the tent very easy to put up. I would also call your attention to the fact that by having the tent made this way, it can be hung up after the packing season is over in such a way as to prevent the tent becoming rotten

when it is stored away if damp or wet. I built a framework which I will leave standing, and put in a floor of one-inch boards because they were cheaper and took the floor up at the end of the season to prevent it becoming warped if it remained out all winter. The cost of this tent was \$80, the lumber \$25, work of putting up the frame and tent \$20, making the total cost of \$125. And I want to say that I believe I had the best packing house in Hood River, for the reason that a tent gives you a much better light than you can possibly secure in any packing house where you depend for your light through windows, no matter how many windows you put in. In addition to this, I want to call your particular attention to the fact that a tent which affords ample facilities for packing 10,000 boxes, or more for that matter, only costs \$125. You could not erect a decent looking building which you would want to leave permanently on the place, of the same size, for less than \$1500 or more.

I used a grading machine which made two grades, sorting into nine sizes, setting back the C grades and cooking apples and running these through the machine at the next run, which reduced the amount of rehandling to almost a minimum, because the percentage of C grades and cookers in any well-regulated orchard should not exceed approximately about 15 per cent of the crop. Benches were arranged alongside of the packers, affording a place for the packer to set off his box without loss of time. Packing paper was placed on these benches in close proximity to the packers, and also the layer paper, the lining paper being hung on the posts supporting the ridge pole, so there was no loss of time on the part of the packer in securing either his box, wrapping paper, lining paper or layer paper, or in setting off the box. With such facilities, and even mine could be improved upon, a good packer can pack from 100 to 125 boxes per day. 100 boxes a day at 3½ cents per box would make \$3.50 per day of ten hours, which is pretty good wages during these hard times. I think any packer would be willing to work where facilities were such that he could pack out 100 boxes a day and at 3½ cents per box, which would enable him to make \$3.50 per day or more, according to the number of boxes packed. Therefore, I believe the cost of packing in the near future can be reduced one-half cent or more.

Picking is one item in connection with harvesting a crop of apples which is the most difficult to do efficiently and at the same time economically. I find picking costs vary all the way from 3 to 8 cents per box. Last year my picking cost was 8 cents per box. This year it was .0546 per box. It is difficult to make a comparison of one orchard with another on the cost of picking, because the cost of picking will vary greatly on account of the age of the trees, the size of the crop on the trees and the size of the apples. There is one thing I do not believe in, and that

is too much speed in picking. Too much speed means too many apples that are bruised and consequently a heavy loss. Too much speed also means too many spurs pulled off and too many stems pulled out. When a stem is pulled out, if the skin is broken, the apple is unfit for any of the marketing grades except the cooking grade. If the spurs are pulled off your crop is not only shortened for next year, but for many years afterward, as apple spurs continue producing for many years. Therefore, I never hurry my pickers, but aim to find out by watching some average picker closely, how many loose boxes he can pick a day and then trying to maintain this average on the part of the other pickers. In order that you may understand my cost of picking being higher than I think it should be, I want to explain to you that four acres of my orchard were old trees with a medium crop, therefore requiring much ladder work, necessarily making the expense greater in picking. In addition to this, 32 acres were in young orchard which are just beginning to bear, which also increased the picking cost per box. The size of the apples all the way through was good, as I had 76% 4 tier, 17% 4½ tier and only 7% 5 tier. Practically all of the 5-tier crop came from old Newtown trees, which was my own fault, because, although I thinned them to one in a cluster, I did not thin them sufficiently, as the crop on these Newtown trees in the old orchard was unusually heavy.

The total number of days in picking was 156 for all the men engaged, making an average per picker of 50 loose boxes per man per day, which in my case was equivalent to 35 packed boxes. My pickers were paid \$1.75 per day, with the exception of my regular men who helped out in this work part of the time, and who received more. The cost of picking can be reduced in several ways under the same conditions. The kind of ladder used is a big factor in the cost of picking. The ladder should be light, of convenient shape, so that it can be quickly and easily handled.

It cost me one cent per box to make my boxes, including the nails. Some saving can be made on box making by either training one of your own men especially in this line of work or securing the services of an expert box maker who can make them at three-quarters of a cent per box and make good wages.

My grading cost me .0321. This, however, included the wiping of the entire crop, which was necessary because I had applied bordeaux spray on the 20th of June and again on the first of August. It is my opinion that grading, even including a normal wiping, can be done at a sum which will not exceed to any great extent 2½ cents.

Hauling empty boxes to and the filled boxes from the orchard to the packing house cost me .0087. A saving could be accomplished in this line by using a

Continued on page 25

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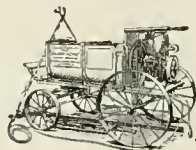
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National Publicity for the Northwest-ern Box Apples.—As a result of the conference held between the Executive Committee of the Fruit Growers' Council and the Shippers' League, a plan was suggested at an informal conference of those connected with the fruit industry at the Eighth National Apple Show at Spokane, advising the appropriation of one cent per box to be spent in an advertising publicity campaign for the purpose of market extension, greater distribution and increased consumption. The subject was presented purely in a tentative form at a conference in Spokane without any definite plan, in order that the fruitgrowers, the selling concerns and others connected with the fruit industry might have an opportunity to give the matter serious thought and be prepared to discuss any plan that may be presented at a meeting of the Fruit Growers' Council and selling concerns to be called in January, 1916. While there were many strong advocates at Spokane there was some opposition, one district in particular feeling that each section and each selling concern can best spend its own money in its own way in creating the demand and a market for its own particular brands. It is not the intention in this article to take any particular stand in either recommending the appropriation or opposing it. However, it seems desirable that the matter should be presented and given to the fruitgrowers and allied interests in as public a way as possible, in order that they may give the matter due consideration and be in a position to decide and decide wisely at the meeting to be held in January. Such a fund, in accordance with the crop, the number of districts and growers contributing, will amount to anywhere from \$50,000 to

\$100,000. The plan is worthy of serious thought. If by the expenditure of one cent per box new markets can be created or consumption in any of the large markets increased to a sufficient extent so as to consume 2,000 or 3,000 carloads, there is no question that the pressure in many other marketing and distributing centers would be relieved and consequently better prices obtainable. If this can be accomplished it does not seem that any one district will be justified in declining to contribute even though they do not succeed in selling one box of their own apples as a direct result of the campaign, because if the market was relieved in other sections where they are operating, their extra profit would easily be more than enough to justify the expenditure. Before such a campaign can be endorsed by the growers and their consent given to such a contribution, it seems reasonable to assume that some definite plan for this expenditure must be presented, although it will not be necessary to go into the entire details of the plan. The contributors also must be convinced that the money will be wisely spent; that the campaign shall be conducted with reasonable expense in putting it into operation. It is a well-known fact that many fruitgrowers did not make the cost of production last year, and therefore they will not look with favor upon any plan that will create positions which will enable a few to draw down some big salaries. Those best informed have no anxiety or fear in this respect, inasmuch as this campaign and the fund is to be placed in the hands of three of the ablest men who can be selected, one by the Chamber of Commerce of the City of Spokane, one to be selected by the Chamber of Commerce in Seattle and one by the Commercial Club in Portland, and the clearing houses in these respective cities. It seems reasonable to assume that the growers need have no fear of such a committee either wasting the money or creating an institution that will make a lot of positions at high salaries. Therefore it is to be hoped that a plan will be devised and presented that on the face of it will look sufficiently well to justify the growers in contributing their one cent per box, because the apple industry of the Northwest certainly must avail itself of every opportunity to extend its markets, create a wider distribution and an increased consumption. Every district and every selling concern in the Northwest must expect to stand on its own bottom and create a business for its own particular varieties or its own individual brands. However, it may be true that all the districts and selling concerns can co-operate together for a general increased consumption and extension of markets and a better distribution.

The Growers' Council and Its Accomplishment.—As a result of a conference in Spokane in 1914 and the work of the By-Products Committee, it was decided to hold a marketing conference

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in Seattle. Consequently a call was issued for the different districts to send delegates to a meeting which was held in Seattle early in January, 1915, for the purpose of discussing marketing problems. A second meeting was held at Tacoma in February, 1915, which resulted in the organization of what has been known as the Fruit Growers' Council with a Board of Control of ten and an Executive Committee of three. Many claim that the Growers' Council has obtained no definite results. Many growers expected the Growers' Council would be able to fix and dictate prices—an unjustified expectation. The Executive Committee has accomplished a great deal more than they have received credit for. It is a well-known fact that during the season of 1914 there was no harmony prevailing between shipping associations. Much feeling of bitterness existed, and competition was very keen both in the campaign for tonnage and in the selling campaign. Just how and in what manner it is difficult to say, but nevertheless it is generally conceded by many who were well informed that the Executive Committee has been a prominent factor in creating a more harmonious condition and a better relationship with all of the interests identified with the fruit industry. As a result, harmony has prevailed and reasonably good prices are being obtained. One noticeable factor in connection with the marketing organization this year has been the lack of unwarranted personalities which were indulged in freely in previous years. The different officials connected with the selling concerns apparently are on a friendly and harmonious basis. In fact, this is indicated by the fact that the marketing concerns have formed a committee known as the

Shippers' League, which has met with the Executive Committee of the Growers' Council in the most friendly sort of an attitude. As a result competition and campaign for tonnage have been free from personalities and the sales more or less free from the harmful competition that existed last year. Each one of the marketing concerns has recognized the right of the others to exist and continue.

The Wenatchee Fruit Growers' League.—One of the marvelous creations during the present readjustment of the apple business was the splendid organization known as the Wenatchee Fruit Growers' League. Through the co-operation of the state, this league succeeded in making effective in the Wenatchee district (a very large area) a plan for state inspection of all apples, which has resulted in every grower, no matter how he shipped, whether independent or through any of the selling organizations, being compelled to submit to a state inspection. After this inspection was made the official stamp was placed on the shipment. When a carload was shipped, an official certificate of inspection was issued by the official inspectors. The force of inspectors consisted of 51 men working under the supervision of O. T. Clawson as chief inspector, in connection with Mr. Adams, president of the Wenatchee Fruit Growers' League. The result of this being that every grower in Wenatchee has put out a consistently uniform grade, establishing a standard valuation on every ear of apples, according to the variety, grade and market conditions. It is therefore our pleasure to commend Wenatchee for the excellent work it has done along this line and to suggest this plan to other districts for their consideration. The Wenatchee Fruit Growers' League are showing a spirit of co-operation with other districts along lines whereby all districts can work together with harmony to the betterment of the industry throughout the Northwest, the president, Mr. Adams, having offered to visit any of the principal fruit-growing sections to explain this plan—its operations, how it is carried out—provided any district is willing to pay the expenses of such a trip. Mr. Adams voluntarily offering to contribute his own services and knowledge without reimbursement.

Economy.—The Oregon Legislature, owing to financial conditions, felt compelled to adopt a rigid system of economy in all departments. It is sincerely regretted that it seemed necessary to extend this to the Oregon Agricultural College on account of the excellent work it has been doing and is doing. However, the new law provides for an experimental fund to be contributed by each Legislature, effective for two years, at the end of which time a new appropriation must be made. It seems regrettable that such a law seemed necessary, for the reason that the Experiment Station men say that many problems require many years' investigation

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before they can be expected to be solved. Consequently at the present the Experiment Station of the State of Oregon is somewhat hampered by the limitation, being unable to engage in experimental work which cannot be expected to be reasonably worked out during the life of the fund, which is limited to two years.

Selling Organizations.—In America where every man is free to engage in any line of business he sees fit, with comparatively few restrictions, it seems only fair and just to concede that every selling organization in the Northwest has the right to exist and continue, provided it can make satisfactory returns to the growers that will compare favorably with other marketing concerns doing business in the same territory. The opinion generally prevails that at the present time the Northwest is amply supplied with selling organizations. There is apparently no desire evident on the part of any organization to put any other organization out of business. On the other hand, it seems to be more or less the universal opinion, not only among the selling organizations themselves but among the fruitgrowers, that at the present time the number of selling concerns and associations are sufficiently ample to handle the business of the Northwest without increasing the present number. Therefore it is to be hoped that effort will be directed toward increasing the strength of the present organization, whichever ones

the fruitgrowers may prefer in their different localities, instead of endeavoring to create new organizations. Up to the present writing, according to all information obtainable, the general impression seems to prevail that all organizations are obtaining reasonably good prices for the different varieties and grades in the respective districts.

H. F. Wilson, entomologist for the Experiment Station of the Oregon Agricultural College, has accepted a position with the University of Wisconsin, at Madison. Mr. Wilson was highly appreciated for his ability throughout the State of Oregon and Oregon feels that it has lost an able man. However, it is our pleasure to wish Mr. Wilson success in his new position.

No one man will be able to formulate a plan of publicity that will meet with the approval of all districts. Such a plan and campaign can only be worked out in detail to the satisfaction of all sections by giving the matter serious thought and revising and adapting any plan so that all districts and all contributors will be benefited.

**It gets close to
the trees.**

See why on page 12.

Only a Car of Apples

(Continued from November issue.)

BUNCO SKINNER AT BAY

(By C. C. P.)

"Foiled!!!"

A sickening shudder shook the huddled frame of B. S., the Proud Produce Pirate, as, in a hoarse whisper he uttered this single word from between his ashen lips—"Foiled." He had just received the following telegram:

"Have your bank wire my bank to pay my draft, Bill of Lading attached, for one car apples at Dollar Box, or ring off. (Signed) Ruggles, of Red Gap."

B. S., the Proud Produce Pirate, was utterly dejected. Listlessly he lit a cigarette as he gloomily hissed—

"That sage-brush rabbit, Ruggles, must have the Blue Book! O, very well, I guess I am done."

Gradually as he smoked his courage returned. B. S. was thinking—thinking rapidly. "Am I done? No—I have it—ah, yes—'can' the B. S. 'con'—I am a DISTRIBUTOR! Better—I am THE CONTINENTAL MARKET DISTRIBUTORS BUREAU." And B. S. lit another cigarette.

This thrilling narrative will be continued in our next.

DON'T MISS A SYLLABLE.

Produce Reporter Company
CHICAGO

P.S.—Now is the time to subscribe for the BLUE BOOK SERVICE.

Low Grade or Cull Apples.—The returns on carloads of apples up to date on stock below the three established grades,—Extra Fancy, Fancy and C grade,—have been so low that frequently they have not paid the cost of freight, creating a loss which the grower must stand. In addition to this, the loss has been increased by culls preventing the sale of the established grades at profitable prices. Until this stuff is cleaned up, activity in the better grades probably will not be as active as the moderate crop justifies. As stated previously in an editorial in the November edition, it seemed regrettable that such fruit was being marketed. It now seems evident from the loss, as reported on cars shipped, that it was a mistake to have shipped any of this low-grade fruit.

H. S. Jackson, for many years pathologist at the Experiment Station of the Oregon Agricultural College, through efficient work and accomplishments, achieved a reputation extending far beyond the confines of the state in which he was working, which is evidenced by the fact that he was offered a position with Purdue University, Indiana, which, to our regret, was so attractive that Professor Jackson felt compelled to accept it. The good wishes of the fruitgrowers of Oregon and the Northwest in general who have the pleasure of knowing Professor Jackson are universal for his success and prosperity.

Every extra ten cents per box obtained on apples means \$1,000,000 more money to the Northwest. The responsibility of the future success of the apple industry does not depend entirely upon any one section, upon any set of individuals or even upon the growers themselves. This responsibility rests on all of us,—every one who is connected with the fruit business either directly as a grower or seller, every one who is connected indirectly, every banker in the Northwest and every business man in the Northwest.

1914 and 1915 have given the growers some experience and knowledge that they never before have possessed which should be of inestimable value in evolving a campaign for 1916 that will mean profitable returns to the orchard industry. Never before in the history of the apple industry of the Northwest have growers, selling organizations, bankers and business men given the fruit industry as serious thought and consideration as they have during the past two years.

We have received no data regarding the short course of the Washington State College. Full information can be received by those desiring the same by writing the Washington State College, Pullman, Washington.

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Winter Injury of Fruit Trees More Common in Northwest

By Professor O. M. Morris, Washington Agricultural College, Pullman.

WINTER injury of fruit trees has been more common in the Northwest than we are sometimes willing to admit. The orchards as a whole have not suffered seriously, but certain sections of fruit-growing districts have been bothered with this trouble in one form or another. This trouble is not confined to any one district or any one kind of climate. Winter injury is very common on the west side of the Cascades in Washington and Oregon. It seems strange that localities with such mild winter climates should have their trees seriously injured by winter temperatures, but such is the case.

When we look about for a cause for this winter injury, we should not forget that our apple trees in particular come from climates and sections that are altogether different from the climate and soil conditions existing in most of the fruit-growing sections of the Northwest. Our apples are the direct descendants of a fruit that has its native habitat in central Europe and west-central Asia. The climate there is seldom severe, and while we may not be able to point out particular characteristics, in which it differs widely from our climate, yet we know that it is different, and that when the apples were brought to the United States, the first settlers placed them on the Eastern coast with a climate very different from that of the Western coast regions, and only a few of the varieties that were brought from Europe direct are still in cultivation. Most of them have passed out of existence; not because varieties that were larger or finer qualities were discovered, but because varieties were discovered that were in many respects more satisfactory from a cultural point of view. The list of apples grown in Washington and Oregon are practically all direct importations from the extreme eastern part of the United States. The Wealthy, Delicious, Gano, Stayman Winesap are varieties that have originated in the central part of the United States, but practically all of the others came from the Eastern States. There is not, at the present time, a variety that has found acceptance as a commercial fruit that had its origin in the Northwest. The native seedlings replaced the imported varieties in Eastern States, and it is not too much to expect that the native seedlings will in time supplant in this district the imported varieties. The adaptation of any set of varieties to local conditions is not measured so much by their ability to grow and produce fruit under the most favorable circumstances that can be placed about them, but to grow and produce a satisfactory crop of fruit, and at the same time withstand the attacks of pests and unfavorable weather conditions. These unfavorable conditions and extremes are the limiting factors that cause us to

select carefully the variety that we want to grow in any particular district.

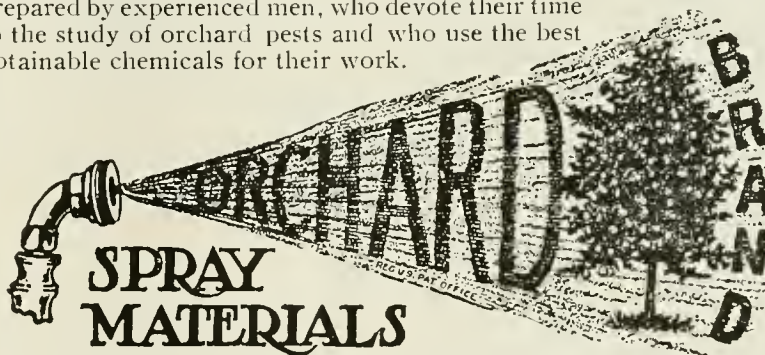
Winter injury results from two quite different sets of conditions. The first is that of a continuous dry cold, resulting in the drying out of the branches and body of the tree, and at the same time exposing it to a temperature so low that the vitality of the wood is lessened or entirely destroyed. This form of winter injury is not common in the Northwest, although it has done considerable injury one or two seasons. There seems to be no method of counteracting the effects of this form of injury, and all that can be done is to select varieties that are resistant. This is the form of injury that is very common in some parts of Iowa, Nebraska, Minnesota and the Dakotas. The other form of winter injury results from one or two conditions; that of sudden fluctuation of temperature while the plant is well filled with sap, or sudden drops to an extremely low temperature while the plant is well

filled with sap. The extreme low temperature results in the death direct of the parts of the tree exposed. This form of winter injury is common in the Northwest.

Probably the most common form in which the injury is manifest is in the freezing and injury of small twigs of last summer's growth. The twigs injured are usually the stronger and more thrifty ones, and the shorter, more slender and less vigorous branches are the last to be injured. Sometimes twigs injured in this fashion are killed direct, and the following spring show no signs of life. The bark may even dry and wither before the time for growth arrives. It very frequently assumes a dark greenish or brownish color, and remains plump, but more soft than the normal tissue, and shows no signs of withering until past midsummer. Frequently buds will develop into short branches or twigs and live until midsummer or a little later, and then die without apparent cause. This form of

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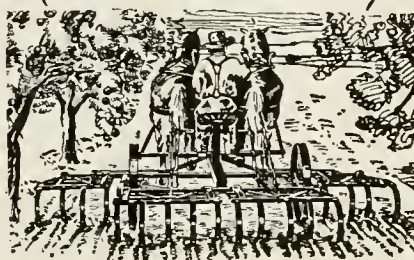
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activity is common for the larger branches of last season's growth, and there is no distinct line of demarkation between this and the injury reaching down the branches to the large limbs, even to the trunk of the tree.

Careful examination of this wood will often reveal the injury within twenty-four hours after it has occurred. The cambium layer of tissue and the sap wood just beneath will be slightly darker in color. When this is found it is a good plan to prune the trees moderately severely. Do not attempt to cut out all injured parts. If the injury is so severe as to cause the discoloration of the entire layer of last year's sap and out into the green bark, then all such wood so injured should be removed. But in many cases, especially with peach trees, it is advisable to do only moderately heavy pruning. Excessive pruning will cut away the younger wood, carrying the larger part of stored food supply away, and the old wood so injured does not have the capacity of producing advantageous buds, and it may result in the death of the plant. When peach trees are injured to the extent of having their small wood killed and larger branches severely injured, it will often result in destroying their entire usefulness, and it is a wise plan to remove them rather than to waste time and energy expecting them to revive.

Another form of winter injury very common with apple trees is first manifest by the bark on the trunk and large limbs splitting open. Ordinarily this does not take place until two or three weeks after the real injury has been done. A good illustration of this happened last winter in the Spokane Valley, when in March hundreds of tree trunks were found to have the bark splitting in a perpendicular line twelve to eighteen inches long. A careful examination of the district and the weather records showed that the injury had been done about the latter part of January, but that swelling of the wood did not take place to a sufficient extent to cause the bark to split until March, when the injury became noticeable. This seems to be the result usually of sudden fluctuations of temperature; usually a sudden drop in temperature following a few slightly warm days. Apparently the lower part of the trees have had time to fill well with sap when the sudden drop of temperature freezes a large amount of water contained in the trunk and bark and in part breaks the tissue. It is found that the cambium layer is broken and nearly all of the cells ruptured. The bark peels very easily and if split with a knife will curl back from the edge of the split. This does not seem to be influenced to any appreciable extent by processes of tillage or cover crop existing in the orchard.

Still another form of injury is the collar injury or winter injury, which is probably the result of alternate freezing and thawing of the surface of the ground around the base of the tree trunks. This is usually not noticed

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until some time after the injury has been done, and at times it is found that the bark around the base of the trees is injured, and sometimes a few inches beneath the surface is dead and rotten. A year later it will be found usually that many roots of the trees are in an advanced stage of decay. This form of winter injury is often very difficult to distinguish with certainty. The presence of the earth and continuous moisture is practically sure to give serious forms of rot and fungus diseases opportunity to gain a foothold on the tissue of the root and trunk system of the tree, and when established even as a saprophyte many forms of toadstools and mushrooms will in part assume the action of a parasite and result in the death of the tree.

The last form of winter injury that I wish to mention is the killing back around the wounds made in pruning. This seldom results from pruning done in the latter part of the winter or early spring. In some few districts it is a common injury that follows fall or early winter pruning. I have not had many reports come to me of this form of injury being at all common in Central or Eastern Washington. I had an opportunity to visit a large pear orchard near Olympia where this form of injury was very apparent and had resulted in great harm to the orchard. It is more common in districts having a great deal of wet weather during the winter than where dry and even more severe temperature is common.

There is a great deal of difference in the ability of varieties to resist winter injury. Some little work has been done along the line of determining the characteristics of varieties that have strong abilities to resist winter injury, but up to date very little satisfactory data has been accumulated. It is well known that the Russian varieties of apples are very hardy in this respect. As a general thing the varieties that form their terminal buds early in the summer and become dormant in early autumn are quite resistant to extremes of temperature during the winter; also to sudden fluctuations. In this state indications are that the Stayman Winesap is one variety that will fail to reach the degree of popularity that its fruit deserves because the trees are not entirely winter hardy in many sections. The Rome Beauty, as a mature tree, is quite hardy, but it is often found that young trees are not satisfactorily resistant where too sudden fluctuations or too extremes of cold are existing.

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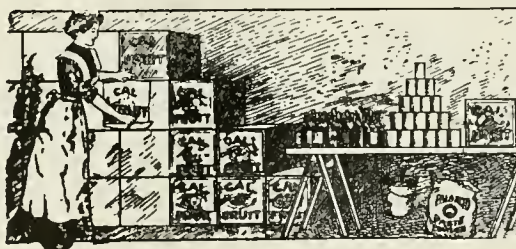




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The Spitzenberg is another variety that in some few localities shows a tendency to be easily injured by extremes and by sudden fluctuations of temperature. The King apple has a peculiar fault of being easily injured at the crown or base of the trunk. The other parts of the tree ordinarily are capable of withstanding great variations in temperature. The McIntosh Red is very hardy when compared to other varieties, in their capacity to resist extremes of temperature. The Jonathan seems to suffer more from the splitting of the bark on the trunk than any other variety commonly grown in the Northwest.

Culture and irrigation are influential factors in preparing trees for winter quarters, and in that way modifying their resistance to winter injury. Extremely late tillage or irrigation often causes trees to continue growth until late in the summer, and thereby are unable to ripen their wood and become dormant before the extreme cold weather sets in. This is not a necessary fault of irrigation or of orchard tillage, but is probably a result that not infrequently follows attempts to force an extra large growth in trees or an

extra large size of fruit. Some districts will find it possible to irrigate much later than others. But where the season is short enough so that the varieties commonly grown ripen in cool, frosty weather, late irrigation should be practiced with extreme caution.

Winter injury does not give an opportunity for the development of fungus diseases direct, but there are saprophytic fungi widely distributed and practically always starting immediately upon winter-injured wood. One form of this is very common in the Northwest, and has caused a great deal of anxiety among orchard men. They have noticed the presence of this fungus and called it canker. There are not many forms of canker existing in the Northwest, but the term has carried with it something of dread because it does not explain anything, but simply expresses the thought of a disease of rather unknown characteristics working upon the wood of the tree. All that is necessary when this fungus is found growing on winter-injured wood is to cut away the winter-injured parts of the trees and the fungus will practically always be stopped.

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National Apple Show Notes

Prizes at the Spokane Apple Show, November 15 to 20, 1915, in addition to the 100-box contest, were on 5-box lots, which consisted of many beautiful and attractive displays. The following is a list of the winners:

Spitzenberg—First prize, W. J. Hess, North Yakima, Washington; score 92.2. Second prize, H. C. Mellor, Summerland, B. C.; score 85.3. Third prize, Fred A. Benson, North Yakima; score 84.2.

Winesap—First prize, John Kern, North Yakima; score 95.5. Second prize, S. W. Bair, North Yakima; score 90.9. Third prize, W. H. Porter, Greenacres, Washington; score 89.3.

Missouri Pippin—First prize, Robert McCormick, Zillah, Washington; score 91.9.

White Winter Pearmain—First prize, J. J. Griggs, Brewster, Washington; score 93. Second prize, C. E. Chase, Brewster; score 91.8. Third prize, C. K. Huntington, Fruitland, Washington; score 82.8.

Yellow Newtown—First prize, H. Van Marter, Opportunity, Washington; score 91.2. Second prize, H. E. Fairbanks, Selah, Washington; score 89.6. Third prize, Harry E. Nelson, Opportunity; score 89.2.

Stayman Winesap—First prize, W. J. Hess, North Yakima; score 97.7. Second prize, H. C. Mellor, Summerland; score 90.3. Third prize, C. C. Shiver, Otis Orchards, Washington; score 88.1.

Grimes Golden—First prize, W. J. Enright, Chester, Washington; score 90.1. Second prize, George Cook, Naramaha, B. C.; score 80.4. Third prize, A. Davidheiser, Opportunity; score 80.1.

Wagener—First prize, W. J. Enright, Chester; score 94.2. Second prize, H. C. Mellor, Summerland; score 90.8. Third prize, Dr. W. A. McDowell, Otis Orchards; score 85.8.

Baldwin—First prize, George F. Blood, Spokane Bridge, Washington; score 87.2. Second prize, H. C. Mellor, Summerland; score 85.5. Third prize, Ed Walters, Spokane Bridge; score 83.6.

Mammoth Black Twig—First prize, H. S. Budgell, North Yakima; score 94.7. Second prize, J. F. Forrest, Otis Orchards; score 86.9. Third prize, H. D. Reeve, Otis Orchards; score 86.7.

Arkansas Black—First prize, Fred A. Brown, North Yakima; score 92.3. Second prize, H. Van Marter, Opportunity; score 89.8. Third prize, D. L. Ingard, Fruitland, Idaho; score 85.4.

Bainier—Second prize, Robert Johnson, North Yakima; score 63.6. Third prize, W. W. Scott, North Yakima; score 55.3.

Rhode Island Greening—Third prize, C. M. Lockwood, Opportunity; score 60.2.

Ben Davis—First prize, C. W. Young, Fruitland, Idaho; score 85.0. Third prize, D. J. Collin, Wenatchee, Washington; score 61.8.

Black Ben—Second prize, Dr. S. M. McBride, Fruitland, Idaho; score 76.4. Third prize, Ed Millin, Cashmere, Washington; score 60.6.

MacIntosh Red—Second prize, W. J. Enright, Chester; score 77.7.

Jonathan—First prize, H. C. Mellor, Summerland; score 91.6. Second prize, J. B. Felts, Opportunity; score 87.4. Third prize, C. S. Howatt, Otis Orchards; score 86.6.

Delicious—First prize, Wellington Dutch, Wenatchee; score 92.3. Second prize, L. E. Ludwig, Winesap, Washington; score 81.3. Third prize, A. Davidheiser, Opportunity; score 59.6.

The Washington State Horticultural meeting was held at Spokane, in the Chamber of Commerce Building, November 15, 16 and 17. The attendance was not as large as in previous years when the meetings were held in the large fruit-growing districts, but the program was very interesting and instructive. J. Howard Wright of North Yakima was elected president; J. F. Segrue, Cashmere, vice-president; F. E. Williams, Spokane, second vice-president; J. A. Harader, North Yakima, secretary; A. G. Craig, Spokane, treasurer. The next annual meeting will be held at North Yakima. The last time the meeting was held in North Yakima the attendance was between 700 and 800, so it is to be expected that next year the meeting will have an immense attendance.

The Utility Manufacturing Co., which is now manufacturing the Wood's grading machine of Ogden, Utah, gave a practical exhibition of their fruit-grading machine, which will be placed on the market throughout the Northwest in 1916, demonstrating the machine's actual operation and commanding a great deal of attention. The exhibit was in charge of Mr. M. L. de Julien, who not only intelligently but very ably showed the advantages and economy in fruit grading machines, at the same time pointing to the practicability and simplicity of his own machine.

The Washington Horticultural Society are advocating a plan for life membership with a view to creating a fund, the interest on which will be a big help in financing the annual meetings. It is planned that the life membership shall cost fifteen dollars. This plan is certainly a move in the right direction, it having been tried out by the Oregon State Horticultural Society, proving very successful, as the Oregon society already has a large list of life members.

Mr. H. C. Mellor, of Summerland, B. C., won the Grand Sweepstakes in the five-box contest, this prize being put up for the exhibitor winning the largest number of prizes in the five-box contests.

Cashmere made a very interesting booth exhibit, featuring the Skookum Brand in a very attractive manner, the display being a beautiful one indeed.

For More Milk

SHADY BROOK DAIRY FEED

Made of the finest alfalfa from the famous Gardens District and from cane molasses guaranteed 50% sugar

HERE IS THE ANALYSIS:

Crude Protein	14.75%
Crude Fat	1.10%
Carbohydrates	63.96%

That's why it gives more milk for less money. Try it. Find your answer in the milk pail.

Write for booklet No. 70
Shady Brook Milling Co.
Walla Walla, Wash.

Write for name of nearby dealer.

\$60.00 an Acre Best Bargain in the Valley for the Price.

160 acres, mostly bottom land; about 60 acres in cultivated fields and pasture, balance timber of commercial size; rich loam soil; plenty of water; good buildings; one-half mile to school; one mile to railroad station. Fall seeding finished; grain for spring seeding and feed; lots of hay; 20 head of stock, tools and machinery. \$6850 cash, balance on time.

HAZELROOK FARM
Box 1, BLODGETT, OREGON

Western Pine Box Sales Co.

HIGH GRADE FRUIT BOXES
APPLE, PEAR AND PEACH BOXES
Fruit and Vegetable Crates
GOOD SERVICE—Write us
SPOKANE, WASH.

One exhibit commanding an immense amount of attention was that made by Yakima Valley, under the direction of Mr. DeVise, which consisted of films showing the various phases of the apple industry. One particular feature which commanded a great deal of attention and interested the public was the production of a big "Y" of apples. Mr. DeVise is one of the prominent men of Yakima associated with the industry, never failing to be present when anything is being done for the improvement or betterment of the industry. Mr. DeVise is very popular among the fruitgrowers, with a very extensive acquaintance, his efforts being voluntary and most of them without reimbursement, but they are much appreciated, as he has worked earnestly in his endeavor to help the fruitgrower better his condition.

The Bean Spray Pump Co. made a practical exhibit of one of their well-known power sprayers which is so popular in the Northwest, practical demonstrations being given by the man in charge.

The Spokane fruitgrowers had one of the most novel and interesting exhibits as well as attractive in the whole show, featuring the "Redskin Brand". This whole display was rendered additionally attractive by the exhibition of Indian relics,—beads, baskets and other paraphernalia,—all being in perfect harmony and accord with the name of the brand. The exhibit of Indian relics was valued at over \$2,000. During the entire show an Indian, dressed in his native costume, was always on the job, commanding a great deal of attention.

Perhaps one of the most instructive features of the exhibit was that engaged in by six different fruitgrowers' organizations with an exhibition of different varieties of apples, consisting of fifteen boxes of each variety, five boxes of each being packed in the regular pack,—Extra Fancy, Fancy and C grade. The importance of this exhibit was its educational value in showing not only how the different grades are put up but how they should be put up.

The Schmidt Lithograph Co. had a very attractive exhibit showing the importance of making fruit attractive in packages by the use of labels. They made two displays, one group containing a number of labels which they had made for the different associations and fruit concerns throughout the Northwest, and the other booth being exceedingly attractive, showing a box of big apples with the "Skookum" label at the end of the box.

The Practical Box Marker Co., Otis Orchards, Washington, commanded a great deal of attention because they were exhibiting their roller stamps which are designed to stamp on the end of the box, in one movement, the variety, grade, number of apples contained in the box and the grower's name. The growers took much interest in this exhibit because every fruit-grower is out these days for something to save money in the cost of production.

One of the most attractive exhibits of the whole show was that made by the Yakima Valley Fruit District Growers' Association, consisting of Winesaps, 100 boxes being arranged in the form of a large letter "Y". The apples were all of magnificent color, beautifully packed and the whole exhibit exceedingly attractive.

Mr. Henry Tweed of Pullman, who prepared the exhibit from Brewster which won the Sweepstakes at the Panama Exposition, was much commended by the many fruitgrowers who were present over his success in preparing the exhibit which won the prize.

Mrs. S. A. Wright of Opportunity, Washington, exhibited a new variety of apple known as "The Oregon Red Winter," which won the prize for the best new variety on exhibition at the show.

The Alpha Automatic Power Spray Outfit

(PATENTED)

Fitted with 2-in. or 2½-in. AUTOMATIC DUPLEX or TRIPLEX PUMP

The Automatic Pressure Governor Insures Safety, Secures Uniform Pressure and Eliminates Unnecessary Wear. Relief Valve Not Required.

Insures
Safety

Secures
Uniform
Pressure
and
Eliminates
Unnecessary
Wear

Top Guard
Rails Fold
Up or
Can Be
Quickly
Removed

Gear or
Belt
Driven

No Relief
or
Diaphragm
Valve
Required

Brass Fitted
Throughout



Fig. 1693

Equipped with the New Mechanical Pressure Control.

THE TWO ESSENTIALS in a power sprayer are a thoroughly dependable engine of ample horsepower and a positive and reliable pressure regulator that will insure uniform pressure and eliminate unnecessary wear.

THE AVERAGE SPRAY RIG is equipped with a cheap engine and a make-shift pressure relief valve or diaphragm which is exposed to the corrosive action of the spray material, which soon puts it out of commission.

THE ALPHA AUTOMATIC PRESSURE GOVERNOR with which the Alpha Spray Outfit is equipped is a simple arrangement of two levers and a spring on each plunger connecting rod, which, when the pressure reaches a pre-determined limit, automatically discontinues the operation of the pump without interrupting the driving power, again permitting it to resume operation when the pressure falls below the point at which it has been set.

THIS INSURES SAFETY, secures uniform pressure, and eliminates unnecessary wear (no liquid pumped except it passes through the nozzles), the pressure relief is not dependent on the operation of a sluggish or defective relief valve, but is positive and mechanical, thus making it impossible to run the pressure up to the danger point.

THE POWER PLANT, depending on the size rig, is either a 2½-H.P. or a 3½-H.P. Alpha Engine, equipped with a "built-in," gear-driven, positively-timed magneto, requiring no batteries or coil, and is easily started on the magneto without cranking.

CAN YOU AFFORD to own a spray outfit that will balk? When you get ready to spray you have no time to tinker with a defective engine, pump or relief valve, but want an outfit that is capable of a continued high pressure maintenance and one that is thoroughly dependable in every particular.

THE ALPHA AUTOMATIC SPRAY OUTFIT will meet your most exacting demands. The entire framework is made of channel and angle iron, fitted with a wrought steel bedplate on which the engine and pump are mounted, direct connected with machine-cut steel gears.

BUILT IN ALL SIZES from a 2-inch pump and a 100-gallon tank to a 2½x3-inch pump and a 200-gallon tank, either duplex or triplex.

IT WILL PAY YOU to investigate thoroughly the merits of the Alpha Combination Power Sprayer before buying. Send coupon for Catalog C-2 and prices.

De Laval Dairy Supply Co.

SEATTLE SAN FRANCISCO

Everything for the Dairy.

DE LAVAL DAIRY SUPPLY CO.,
1016 Western Avenue, Seattle, Wash.

Please mail your Catalog C-2 describing your Alpha Sprayer Outfit to—

.....Name
.....Address

The O.-W. R. & N. made a very attractive, interesting and instructive display, which commanded a great deal of attention. Experts lectured and demonstrated, showing the uses of different varieties of apples, the best season for consumption and also the best varieties for cooking.

The Hardie Manufacturing Co. had one of their latest model sprayers on exhibition, which was ably demonstrated and explained to all inquiring orchardists by one of their competent salesmen.

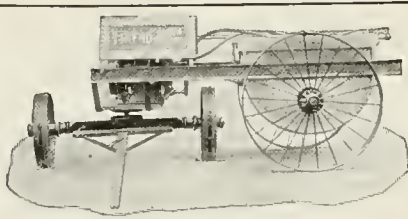
Zillah district had a strong feature exhibit presided over by Mr. H. Furman.

A boys' band, composed entirely of boys from 6 to 15 years of age, not only rendered excellent music but was quite a feature in the show.

The Washington Agricultural College of Pullman was prominent as usual with one of their educational displays for the benefit of the fruitgrower.

Mrs. Blanche Wylie of Spokane daily distributed a number of apple favors to all visitors by giving away apples and tickets for apple cider.

In the cookery contest, one exhibitor displayed 52 kinds of apple jelly labeled "One kind for every week in the year."



Sprayers Go Up

Not in price but numbers

Since August first more than four times as many

"FRIEND" Power Sprayers

have been sold than last year for same period. See last issue of "Better Fruit" and learn why.

Don't Delay, But Do It "Now"

Join the "Friend" Club by the purchase of a Power Sprayer. Hand Sprayer, Unique Pressure Regulator for your old power sprayer. Variable Spray Nozzle or the new 50c Nozzle. Get the "Friend" Spirit. Catalog free.

"Friend" Mfg. Co., Gasport, N. Y.

The Powerful One Man Kirstin

Strong, simple, speedy—this one man way of turning stump land into cash income is the way for you. Many fine, attractive features, such as the

TRIPLE SPEED

This splendid feature lets you triple the speed after the stump has broken loose. That means something to the man who owns a Kirstin.

GET FREE CATALOG NOW

KIRSTIN SALES COMPANY

350 E. Morrison St.

Portland, Oregon

The Idaho Agricultural College exhibited some very interesting information, portrayed on charts, showing the results obtained in a comparative way between summer and winter pruning.

One of the most educational and instructive features of the Apple Show was the by-product exhibit, a number of prizes being given for all kinds of by-products made from apples.

The Oregon Agricultural College exhibited a very interesting chart showing what varieties of apples are best adapted for sauces, jelly and various other desserts.

The Oregon Horticultural Society held its annual meeting in Corvallis November 16, 17 and 18, which was attended by a very large and enthusiastic audience. Every one present reported the program the most instructive of any for a number of years. In addition to this, which probably was the most important part of the program, was the featuring of exhibits and the instruction given in connection there-

with by the professors and their assistants in the different departments of horticulture. Apples were exhibited from nearly every fruit-growing state in the Union. These exhibits proved very interesting and instructive. The following officers were elected: R. C. Washburn, president; B. W. Johnson, vice-president; C. D. Minton, secretary-treasurer. The next annual meeting will be held in Hood River.

Protect Young Apple Trees.

It is time to protect newly planted apple trees against winter girdling by mice and rabbits. A tree thoroughly or even partly girdled has little or no chance to live without expert bridge grafting, which is not especially easy, at least for the man who is unaccustomed to it. Perhaps the best protection is obtained by using a thin wooden veneer wrapper which has been soaked to keep it from breaking, then bent around the tree, and held in place by a single wire about the middle. The wire stays in place better if passed through a hole near the outer edge of the veneer wrapper. The wrapper should be pushed down into the earth so that mice cannot burrow under it, or they may be shut out by heaping soil up around the bottom of the case and tramping it firm. Coiled screen wire may be used in much the same way, but it is more expensive. The veneer wrappers do not usually cost more than half or three-quarters of a cent apiece, and can be secured from any orchard supply house.

Bunches of long grass or split corn stalks may give good protection against rabbits, but fail to keep mice from doing harm. Newspapers or tar paper wrapped around the tree trunk have been used with some degree of success by many orchardists.

Paint and washes do not give good results, as the rabbits sometimes seem to attack the washed trees more than the untreated ones.

Damage from mice should be avoided by the removal of all loose, trashy material from the neighborhood of the base of the tree trunk. If the ground has been fall plowed, the under furrow slice furnishes a good nesting place for mice and the nearby trees are likely to

What are your dairy problems?

To get started profitably in dairying as a side-line, the fruit grower needs helpful advice and suggestions.

Our service department will delight in doing this very thing, without any charge or obligation.

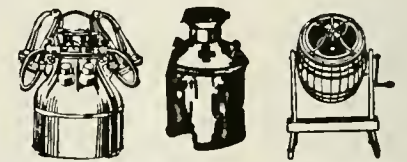
We are sole Oregon distributors for "Simplex" Separators, B-L-K Milkers, Papec Ensilage Cutters, Simplex Silos and all kinds of dairy, butter-making and cheese-making supplies.

Your name on a postal will bring Free Catalogs

Monroe & Crisell

126 Front St.

Portland, Oregon



It does not disturb the fruit burdened branches.

See why on page 12.

suffer, but if the ground near the tree is clean and well compacted, little damage will be done by these rodents.—C. C. Wiggins, College of Agriculture, University of Missouri.

Exports of green apples to Europe for the week ending November 13, for the first time this year, exceeded the exports of the corresponding week of 1914. During the week 93,823 barrels were exported, as against 89,383 for the previous year. The total exports of the season are 530,921 barrels, compared with 998,644 barrels last year.

Pear Trees for Sale

I have a large lot to offer of the following sorts: Bartlett, Anjou, Bosc, Winter Nelis. B. Clairgeau, Howell, Comice and other varieties. All budded trees, one and two years old.

I also have Plum and Prune Trees budded on plum, and budded berry-bearing and seedling Holly Trees from 2 to 5 feet. Also Mazzard Cherry and Marianna Plum stocks for nursery planting.

Good stock at very low prices to Nurserymen, Dealers and Planters.

JAMES W. STEPHENS

Kelso, Washington

Economies in Apple Harvesting

Continued from page 15

wider wagon than the one I used, or a double-decker. My wagon held only 24 boxes, when a wider wagon could be made to hold 36 boxes or more, or a double-decker 48 or more. This, of course, would make quite a reduction in the expense, saving time lost with the small wagon, hauling from the orchard, but of course would not save any time in loading or unloading in either case, as this expense would be the same on the larger or smaller wagon.

Help in the packing house cost me .0086. This consisted of having a man put the apples on the sorting table. Considerable saving could be made in this department with the right kind of a storage house and a good floor, which will enable the helper in the packing house to load the apples on a truck which would hold 24 boxes instead of carrying them one by one, leaving him part of his time, with this arrangement, to assist in grading, also helping to reduce the number of men required on the grading. The floor in my packing house, not being on a level with the storage equipment, necessitated my having the apples carried by the box instead of being wheeled in on a truck.

Hauling knocked-down boxes to the packing house cost me .0025. This cost could also be reduced by having a larger wagon which would hold a greater quantity, requiring no more time than a wagon containing a smaller quantity of boxes. My wagon was only large enough to haul 250 boxes, knocked down, at a time, whereas the proper-sized wagon should be one which would hold 100 to 110 boxes packed, which would hold 400 knocked down boxes, which would reduce this cost about 33 1/3%.

It cost to nail up and stamp the boxes .0096. The man doing this work had some spare time, although it was all charged against the nailing cost. This time he spent in removing any apples which got into any one of the grades through carelessness or any other cause on the part of the sorters and graders. The stamping was done with rubber stamps. An additional saving could be made by using the latest patented devices for stamping the boxes with the number of apples, the grade, and the variety all at one time instead of having to use separate rubber stamps for each of these marks. Just how much this nailing-up cost could be reduced it is difficult to say, but I am inclined to think it could be done at one-quarter to one-half a cent less.

The boxes cost me 9 cents each. This price seems to be as low as any price I have heard of. A lower price could only be secured in accordance with the price of lumber and by ordering the boxes of your association, which could place an order with some mill for an extra large quantity early in the season, thereby securing a lower price.

The paper cost me .0331. No saving could be made in this item except

PICTORIAL REVIEW



CHRISTMAS 1915 FIFTY CENTS A COPY \$1.50 A YEAR

Address "BETTER FRUIT," Hood River, Oregon

Pictorial Review

THE MAGAZINE ALL WOMEN FOLKS WANT

For a limited time only we are able to offer our subscribers a very liberal bargain. We can think of no magazine which is so popular with the women folks of America as PICTORIAL REVIEW. The popularity and attractiveness of PICTORIAL REVIEW has been the talk of the magazine world - It is the home and Fashion Guide for 1,250,000 women.

Fashions and Household Helps

For almost ten years PICTORIAL REVIEW has stood supreme in the world of fashion. Besides there are general household helps and hints in every issue of the magazine - the sort of information which every practical housekeeper delights in.

Biggest and Best Offer

"Better Fruit" 1 year \$1.00 Both for \$1.65
Pictorial Review 1 year 1.50-\$2.50 only

\$100,000 for Fiction

\$100,000 has been paid for fiction which will appear in PICTORIAL REVIEW this next year. Four great serial stories by world-famous authors. From four to eight short stories by the best short story writers in the world will also appear in each issue. Besides there will be fact and feature articles that will interest all.

This offer is for a very limited time only, therefore send your order soon and you save 85 cents on your subscription investment.

This combination makes a valuable Christmas Gift
for the fruit grower and his wife.

Prune and Grafted Walnut Trees


Also Apples, Pears, Peaches, Plums, Apricots, Cherries, Small Fruit Plants, Etc.

Can be bought now at Greatly Reduced Prices

Write today submitting your want list for quotations.

LAFAYETTE NURSERY CO., LAFAYETTE, OREGON


Well Water Under Pressure



Your stock need water direct from the well at even temperature, winter and summer

You know that your cows will give more and better milk if they have plenty of fresh, cold water to drink. With my Milwaukee Air Power Water System the water is always at well temperature, and wonderful results are shown when compared with water that has been stored in tanks.

Simply turn the faucet and you get water under a good pressure at any point in the house or on the farm.



Send for my descriptive booklet

THOS. J. ROSS
279 E. Morrison Street
Portland, Oregon

Go Home for Christmas

The holidays will soon be here. The time of happiness and cheer. Your friends will be expecting you to come home - So will mother, father, sister or brother.

LOW HOLIDAY FARES

will be available for the holidays. On sale between all Southern Pacific stations in Oregon and California.

Ask the local agent for fares, limits of tickets
and other information or write

SOUTHERN PACIFIC

John M. Scott, General Passenger Agent.
Portland, Oregon



TWO DAILY LIMITED TRAINS EAST

THE INLAND EMPIRE EXPRESS NORTH BANK LIMITED

PORTLAND TO SPOKANE, ST. PAUL, DES MOINES,
CHICAGO, DENVER, KANSAS CITY, ST. LOUIS

FASTEST ROUTE BETWEEN THE NORTHWEST AND CALIFORNIA

"The North Bank Rail" and Twenty-six Hours' Ocean Sail on the Mammoth Steel Liner, SS. "Northern Pacific" (licensed for 800 passengers), sailing every four days, approximately, between Portland and San Francisco, via Flavel-Astoria.

December Sailings from Portland—December 7, 11, 16, 21, 25, 30.

Best of the Trip in Daylight.

Same Time and Rate as All Rail.

Call or write for details about the 15-day de luxe cruises to Hilo and Honolulu of SS. "Great Northern," December 16, January 5, 25, February 14.

TICKET OFFICES

Fifth and Stark Streets and North Bank Station, Tenth and Hoyt, PORTLAND
SPOKANE, Davenport Hotel. SEATTLE, 107 Yesler Way, Corner Second Avenue and Columbia
SAN FRANCISCO, 665 Market Street

R. H. CROZIER, A. G. P. A.
SPOKANE, PORTLAND & SEATTLE RAILWAY
PORTLAND, OREGON

15,000 PEAR TREES Mostly Anjou and Bartlett Also Other Varieties

Extra fine trees, clean and well grown. Can make you very attractive prices.
We have also a general line of nursery stock.

CHRISTOPHER NURSERIES, Christopher, Washington

through the ability of your association manager to secure supplies in this line at a less price by placing a very large order early with some paper mill anxious to secure the business.

Superintending cost me .01 per box. I charged up my own time at only \$2.00 per day while engaged in this line of work. Considerable saving could be made in this expense in accordance with the quantity of apples harvested, as I could have rendered the same service on twice the amount of apples, which would have reduced this cost to one-half cent per box.

I desire to call your attention to the way these costs should be ascertained. A perfect record should be kept of each man's time and every item of expense in every one of these twelve items connected with harvesting the crop. Most growers figure their picking expense per box on the actual number of boxes packed out, which is incorrect and a way that will never show you anything comparatively. This cost should be placed on the entire number of boxes picked, whether they are packed out or sent to the vinegar factory. The grading cost per box also should be placed on the entire crop, whether packed out or sent to the vinegar factory. Making up the boxes should be figured on the actual number of boxes packed; packing on the actual number of boxes packed; orchard hauling on the total number of boxes harvested; association hauling in the same way,

because it makes no great difference in the cost whether the apples go to the warehouse or to the vinegar factory. Help in the packing house should be figured on the total number of boxes harvested. Knocked-down-box hauling should be figured on the total number of boxes packed out; nailing up on the total cost of the boxes packed out, and the cost of boxes on the total number packed out. Paper should be figured also on the total number of boxes packed out, while superintending should be figured on the total number of boxes harvested, whether packed or not. Permit me to say that these costs are determined on a crop of 5520 boxes packed out and 530 boxes to the vinegar factory; total crop 6050 boxes. The 530 boxes going to the vinegar factory made .087% of the total crop; 300 boxes, or .049% being windfalls and the other 230 boxes, or .038% being culls due to all other causes such as bruises, scab, stings, worms, etc. I had 76% 4 tier, 17% 4½ tier, 7% 5 tier and 89% extra fancy and fancy combined, and 10.2% C grade.

Allow me to state the costs of each department connected with harvesting, with the hope that this information will help some of you to do the work more efficiently and more economically than I have done it, because I believe it can be done for much less and considerably better. Cost of harvesting per box in my orchard was as follows: Packing, \$.04; picking, \$.0546; grading,

\$.0321; making boxes and nails, \$.01; orchard hauling, \$.0087; association hauling, \$.0205; help in packing house, \$.0086; knocked-down-box hauling, \$.0025; nailing up and stamping, \$.0096; box, \$.09; paper, \$.0331; superintending, \$.01; total, \$.3197.

The cost of harvesting a crop of apples can be reduced in proportion to facilities afforded, through economy in material and the wages paid the workmen. I also desire to call your attention to the fact that a saving can be made by maintaining a well-balanced crew in each department of harvesting so that no one department will be held up by a lack of efficiency or help in any other department. It goes almost without saying that the larger the crop the more economically the work can be done. My crop was a moderate sized one, and I want to be frank and state that I know many growers harvested at a less cost than I did this year. My aim has been to outline a plan showing the costs, which would afford every grower a comparison and thereby be of value to him, enabling him to determine where he could reduce his cost in any department, whether his crop be large, of moderate size, or even a small crop.

In conclusion permit me to state that I think the following savings could be made in each one of the departments in my classification. A saving could be made in: Packing, \$.005; picking, \$.015; grading, \$.0075; orchard hauling, \$.0037; help in packing house, \$.0044; hauling knocked-down boxes, \$.001; nailing up, \$.0034; superintending, \$.005; total, \$.045. Or, in other words, I believe a crop of apples can be harvested, with proper facilities and business-like methods, at a cost of \$.2757, which is just about one-half of what harvesting cost us four or five years ago.

ONE MAN

is all that is needed.

See why on page 12.

FEIJOA SELLOWIANA

A wonderfully delicious fruit of delightful aroma. About size of hen's egg. Remarkable keeper and shipper. Pre-eminently adapted to Pacific Coast. Will stand temperature of 10 degrees above zero. Be first to plant and reap greatest profits. Illustrated circular free.

GIANT WINTER RHUBARB

From ½ of an acre first season after planting I sold over 20,000 pounds of rhubarb, receiving for same \$673.70. Reduced prices on plants. Booklet free.

W. A. LEE, Covina, California

Hood River Pruning & Grafting Wax

READY FOR USE

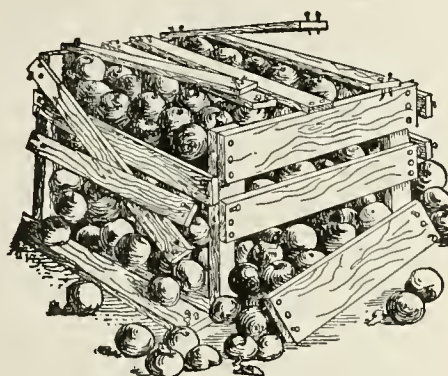
Without Heating

1-lb. Can, postpaid, 60c

Made by

A. NIEHANS, Hood River, Oregon, R 2

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

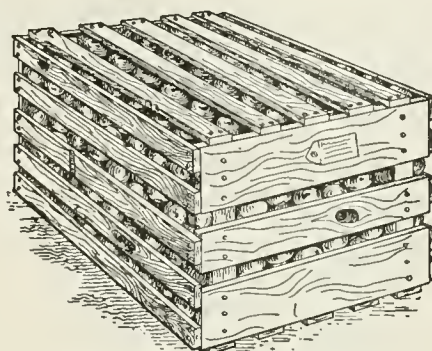
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles

AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

Pruning for Increased Color and Yield

By Professor C. C. Vincent, Moscow, Idaho.

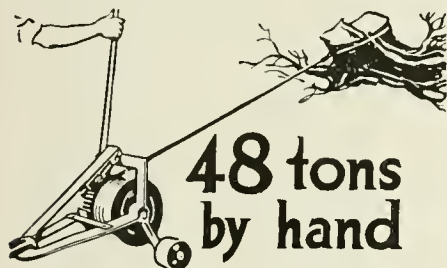
PRUNING orchard trees is one phase of orchard management that has been discussed by practical orchardists and experiment station men at various horticultural meetings for a number of years, hence much has been said and written upon it. But

notwithstanding this fact, it is very imperfectly understood by the masses of people and often wholly disregarded. While it is true we possess climatic conditions very favorable to the growth and perfect development of our fruit trees, which renders unnecessary much of the labor and expense attached to fruit growing in the Eastern States; pruning to an ideal through the various successive stages will be absolutely necessary in order to obtain best results. Intelligent pruning is ever productive of the most satisfactory results, but when it is done indifferently without any regard to the object to be accomplished, an entirely different effect is produced.

The tree is pruned, at various seasons of the year to accomplish very different results. While no fixed rules can be given regarding pruning that will apply to every tree everywhere, there are, however, a few principles which, if kept in mind by the operators, will facilitate matters considerably. Each variety offers problems peculiar to itself, that can be solved only by the good judgment of the man with the pruning shears, but the following points should be observed in every case: (1) All crossing limbs should be removed for spraying is quite an item in the expense of the orchard, and with all superfluous limbs removed before the application, less material will be needed. (2) Prune to encourage the production of fruit rather than wood. (3) Prune to prevent the lower limbs from hindering cultivation; the upper ones from growing out of easy reach for spraying and picking. (4) Prune to prevent the "off-year habit" in trees. (5) Prune to correct too compact or too spreading growth of top.

Since there is no other phase of orchard management that requires as much knowledge and experience as that of pruning, the grower's success will be based largely upon the observance of the above-mentioned rules. As pruning is such a vital factor in the development of a commercial orchard, the time of performing the operation is important. The season for pruning

orchards is generally winter or early spring. In the minds of many orchardists, no other reason is known aside from that of convenience. The growers should know the principles involved and where winter pruning may, with profit, be exchanged for summer



**48 tons
by hand**

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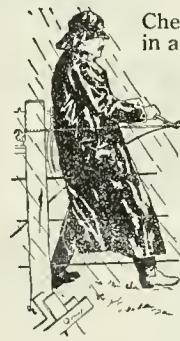
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pruning. Generally speaking, an apple tree may be pruned in any month during the winter without any serious injury, but experiments have proved that there is a definite time during the winter months when it may be done more advantageously—in late winter or early spring. At either of these times the flow of sap is not far distant and the wood heals quicker, thus preventing excessive drying. It is not good policy to prune in midwinter, as the wounds remain too long exposed to the action of the rains, winds, etc., before healing takes place. Early winter pruning, or soon after the leaves fall is preferable to that of midwinter, since there is usually enough sap to start the callousing-over process before severe winter comes on.

The effect of annual winter pruning of the tree is to produce wood rather than fruit. The reason for that can be explained as follows: In a thrifty, healthy, unpruned tree, there appears to a balance between the roots and the top of the tree, or in other words, a sufficient number of rootlets to furnish every bud or growing part of the tree with the necessary elements for plant growth. If too many of the large limbs are removed, there is a lack of equilibrium, and when spring comes the roots still send up more food material, thus causing more sap pressure on each bud. As the amount of pressure on the bud determines its rate of growth, a longer shoot is the result. Thus we can readily see why discretion should be used in pruning orchards, especially neglected orchards. Neglected trees may be brought into a good state of bearing by removing only a part of the wood the first year. If badly neglected, two or three years should be used in bringing the tree back to its natural self. A too severe cutting back will result in a thicket of watersprouts.

Summer pruning heretofore has not been generally practiced in the United States. One reason for this tardy adoption has been that growers did not know of the method. Besides, there is real inconvenience to it. Usually during the summer the grower is busy, cultivating, spraying or irrigating, and does not care to take the time for the necessary pinching or cutting back re-



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quired. However, summer pruning should be more widely practiced by orchardists, for it not only has a tendency to bring the tree into earlier bearing, but actually increases the yield and admits sunlight, which colors the fruit more highly, as indicated in the tables presented below. If summer pruning is followed, the best time to perform the operation is the latter part of July or early August, or about ten days after the terminal buds have set. At this time the tree has practically finished growing for the year. Success will depend largely upon when the work is performed for the following reasons: If the pruning is done before the tree has ceased growing, it will have a tendency to force out the adventitious buds and buds below the cuts, which results in a growth of shoots. On the other hand, if done too late in the season, no opportunity is given the buds to swell into fruit buds, which is the object sought by summer pruning. Where summer pruning is practiced, the tendency is to produce fruit rather than wood. The principle involved is as follows: During the early summer, much of the food is used by the tree in throwing out leaves and making new growth. By removing part of the growth at just the proper time, some of this reserve food material will be deposited in and behind the buds, causing them to increase in size considerably, and thus producing fruit buds.

During the past few years the Horticultural Department of the University of Idaho has been conducting experiments to determine whether summer pruning presented any advantage over that of winter pruning and vice versa. The trees under observation, representing the Wagener, Rome, Grimes and Jonathan varieties, were planted in 1905, and the pruning began that year. The trees in the block set aside for winter pruning have received a moderate annual cutting back since the time of planting, while those in another block have been summer pruned. The pruning in both cases consisted in shaping the tree and cutting back from one-fourth to one-third of the terminal growth. The trees were all grown under like conditions as regards soil and climate without irrigation.

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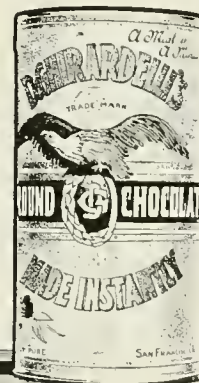
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Pruning for Increased Yield—Result of Summer vs. Winter-Pruning Experiments.

TABLE I.

Variety	Year	When Pruned	Av. Yield per Tree	Per Cent Increase
Wagener..	1910	Winter	29 lbs.	
		Summer	54 lbs.	86.2
Wagener..	1911	Winter	18 lbs.	
		Summer	59 lbs.	227.8
Wagener..	1912	Winter	67 lbs.	
		Summer	123 lbs.	83.6
Wagener..	1913	Winter	22 lbs.	
		Summer	51 lbs.	131.9

Increase 4-year period, 111%, or 136 to 287 pounds.

During the four-year period there was an increase in favor of the summer-pruned Wagener of 111%, varying throughout the four years from 83.6% increase to 227.8% increase.

TABLE II.

Variety	Year	When Pruned	Av. Yield per Tree	Per Cent Increase
Grimes...	1910	Winter	14 lbs.	
		Summer	26 lbs.	42.8
Grimes...	1911	Winter	61 lbs.	
		Summer	73 lbs.	19.7
Grimes...	1912	Winter	74 lbs.	
		Summer	101 lbs.	36.5
Grimes...	1913	Winter	99 lbs.	
		Summer	185 lbs.	86.8

Increase 4-year period, 52.8%, or 248 to 379 pounds.

The Grimes showed, during a four-year period an increase of 52.8% in favor of the summer-pruned trees. The per cent of increase varied from 19.7% in 1911 to 86.8% in 1913.

TABLE III.

Variety	Year	When Pruned	Av. Yield per Tree	Per Cent Increase
Jonathan..	1910	Winter	29 lbs.	
		Summer	33 lbs.	13.8
Jonathan..	1911	Winter	35 lbs.	
		Summer	21 lbs.	*66.7
Jonathan..	1912	Winter	95 lbs.	
		Summer	95 lbs.	00.0
Jonathan..	1913	Winter	128 lbs.	
		Summer	145 lbs.	13.3

*Decrease.

Increase 4-year period, 2.4%, or 287 to 294 pounds.

Paddock & Whipple, in their book entitled, "Fruit Growing in Arid Regions," say that summer pruning is supposed to incite fruitfulness, but does not always give uniform and satisfactory results. While our Jonathans show an increase of 2.4% during the four-year period in favor of the summer-pruned trees, the per cent during the period varies from 13.8% increase to 66.7% decrease.

TABLE IV.

Variety	Year	When Pruned	Av. Yield per Tree	Per Cent Increase
Rome.....	1910	Winter	14 lbs.	
		Summer	14 lbs.	00.0
Rome.....	1911	Winter	95 lbs.	
		Summer	30 lbs.	*116.6
Rome.....	1912	Winter	53 lbs.	
		Summer	58 lbs.	9.4
Rome.....	1913	Winter	52 lbs.	
		Summer	85 lbs.	63.4

*Decrease.

Increase 4-year period, 1.6%, or 184 to 187 pounds.

There has been but very little difference between summer and winter pruning of the Rome during the four-year period. An increase of 1.6% is noticed in favor of the summer-pruned trees.

TABLE V.

	Winter Pruned	Summer Pruned
Jonathan, 9 trees		
Number of Extra Fancy.....	992	5147
Number of Fancy.....	4175	2795
Number of C Grade.....	4138	335
Number of culls.....	322	0
Average yield per tree.....	1069	953
Rome, 9 trees		
Number of Extra Fancy.....	350	1186
Number of Fancy.....	473	422
Number of C Grade.....	587	89
Number of culls.....	0	0
Average yield per tree.....	156	188

Table V presents some interesting results. It shows the number of extra fancy, fancy and C grade apples picked from the winter and summer-pruned trees. Where summer pruning was practiced on Jonathans, 53% of the apples were extra fancy and 32% fancy, while from the winter-pruned trees only 13% of the apples were extra fancy and 43% fancy. Not only did we secure a large percentage of highly-colored fruits, but we were able to pick the apples in the summer-pruned blocks at least two weeks earlier than we could have done otherwise. Then again, as the Jonathan water-cores so badly and breaks down in transit when left on the trees too long in the fall, this objectionable feature was eliminated when summer pruning was practiced. To secure a high percentage of highly-colored apples, summer pruning is recommended.

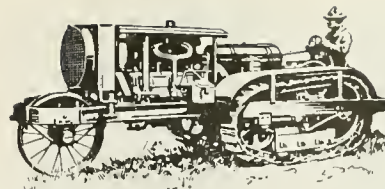
Comparative Value of Different Grades

TABLE VI.		
JONATHAN—NINE TREES.		
<i>Extra Fancy</i> (boxes at \$1)		
Winter pruned, 6 $\frac{3}{4}$ boxes.....	\$ 6.60	
Summer pruned, 36 $\frac{1}{4}$ boxes.....	36.33	
Gain for summer pruned....		\$29.73
<i>Fancy</i> (boxes at 75c)		
Winter pruned, 27 $\frac{3}{4}$ boxes.....	20.87	
Summer pruned, 18 $\frac{3}{4}$ boxes.....	14.00	
Loss for summer pruned....		6.87
<i>Choice</i> (boxes at 50c)		
Winter pruned, 27 $\frac{3}{4}$ boxes.....	13.80	
Summer pruned, 2 $\frac{1}{4}$ boxes.....	1.10	
Loss for summer pruned....		12.70
<i>Culls</i> (boxes at 16c)		
Winter pruned, 2 $\frac{1}{4}$ boxes.....	.22	
Summer pruned, none.....	.00	
Loss for summer pruned....	.22	
Net gain for summer pruned	9.94	
Average gain for nine trees..	1.10	
ROME—NINE TREES.		
<i>Extra Fancy</i> (boxes at \$1)		
Winter pruned, 4 boxes.....	\$ 4.00	
Summer pruned, 13 $\frac{1}{2}$ boxes.....	13.50	
Gain for summer pruned....		\$9.50
<i>Fancy</i> (boxes at 75c)		
Winter pruned, 5 $\frac{1}{4}$ boxes.....	4.00	
Summer pruned, 4 $\frac{7}{8}$ boxes.....	3.65	
Loss for summer pruned....		.35
<i>Choice</i> (boxes at 50c)		
Winter pruned, 6 $\frac{3}{4}$ boxes.....	3.35	
Summer pruned, 1 box.....	.50	
Loss for summer pruned....	2.80	
Net gain for summer pruned	6.35	
Average gain for nine trees..	.70	

To show the comparative value of the different grades, I wish to call your attention to Table VI. Estimating the value of extra fancy apples at \$1.00 per box; fancy at 75 cents; choice at 50 cents and culls at \$5.00 per ton, there is a gain of \$1.10 per tree in favor of the summer-pruned Jonathan trees. Trees set thirty feet apart each way give approximately fifty trees to the acre. A gain of \$1.10 per tree would give a total gain of \$55.00 per acre. It is evident from the above data that summer pruning does pay and pays well: First, by increasing the yield materially; second, by securing fruit of maximum size and color; but we must not forget that in order to secure these results, proper attention must be given to the various other phases of orchard management such as irrigation, cultivation, spraying, thinning and fertilization.

Mr. Fred Graham, industrial agent of the Great Northern Railway, who was in Portland last week, figures that the excellent prices and good crops this year will put the apple grower on a good sound footing.

What Fruit-Growers Say



"To see ourselves as others see us."—We had such an opportunity the other day in a letter the manager of the Santiam Fruit Colony wrote a prospective purchaser in answer to his inquiry regarding the Caterpillar "30." Here are a few characteristic paragraphs:

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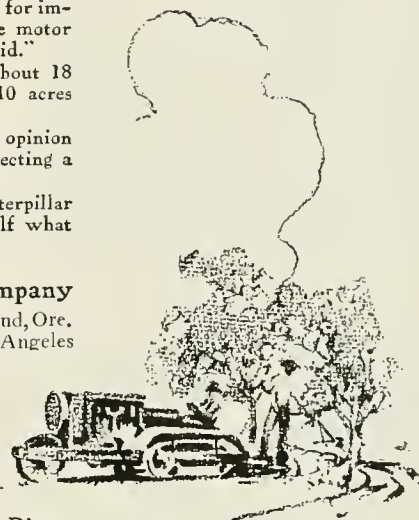
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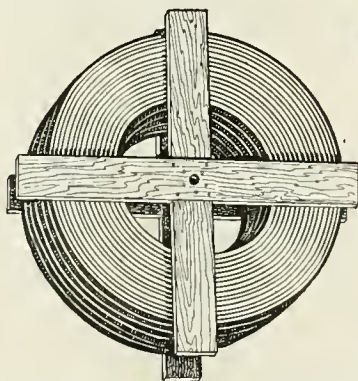
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unless you mean Holt!

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No. 3 Peerless Duplex Strapping in coils of 6,500 feet each—\$14.63 per coil with liberal discount.

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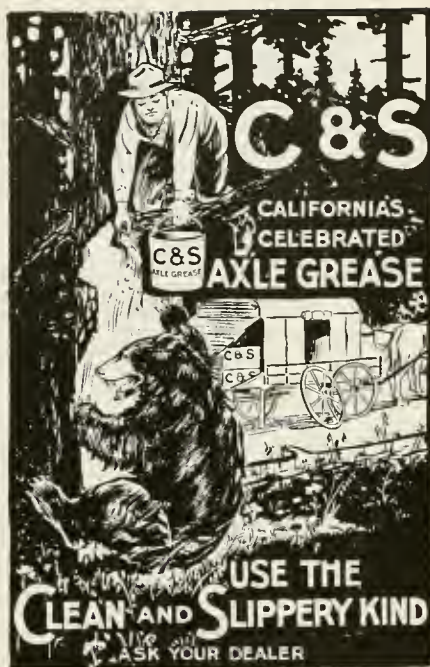
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Destroy the Woolly Aphis Now

"The woolly aphis is one of the most serious pests of the apple tree, for the reason that it lives not only above the ground on the leaves and bark, but it also infests and seriously injures the roots," said H. A. Surface, state zoologist of the Department of Agriculture, Harrisburg, Pennsylvania.

"Its injury to the trees is done by piercing the living tissue with the sharp beak or proboscis, and injecting a poisonous saliva and sucking out the modified sap. Its presence prevents the healing of wounds where it prefers to live, or causes knots which are abnormalities that prevent the flow of sap and the normal growth of the tree.

"A tree that is attacked by woolly aphis at the roots remains stunted, it does not bloom early in the spring nor do its leaves and fruit become large. The knots on the roots caused by this pest are nearly as bad as the knots caused by crown gall. They check the flow of sap and cause the springing up of numerous shoots or root suckers, which appropriate the food taken from the soil by the roots, and continue further to stunt the growth of the tree and impair its fruitfulness and reduce the size of the fruit.

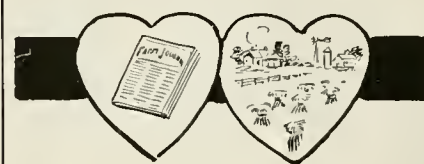
"In the fall of the year the woolly aphids can be seen in clusters around wounds in trees, or even around twigs that are not damaged, and at the bases of leaf stalks and other places where they can get a start. The females deposit their eggs beneath the edges of bark or in cracks, and then proceed to go to the roots of the trees. It is fortunate that the horticulturist can see the pests before they reach the roots, and can thus tell when the trees are liable to become seriously infested.

"It is very important for every apple grower to look over his orchard in the fall of the year and see if the woolly aphids are present. If so, he will be able to observe small tufts, like cotton, which upon crushing are found to yield a brown liquid. By carefully examining without crushing he will find the dark-colored bodies of the woolly aphids beneath the cottony protection.

"This cottony substance is a very effective protection against rain and against most aqueous spray solutions, or spray solutions made in water only.

"There are two or three ways of combating such pests while yet on the branches. One is to rub the clusters where they occur and crush them. If the operator is careful to do this thoroughly he may kill most of them. With this he can combine cutting off the worst infested branches and burning them. They should not be dropped on the ground, because of the danger of the pests reaching the branches or roots. A second method is to paint the attacked spots with brushes dipped in very strong solution of soap or nicotine extract, or a combination of both. The best preparation is made by using one ounce of strong commercial nicotine extract in about four gallons of water, containing at least one pound of

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Trap resets itself; 22 inches high; will last for years; can't get out of order; weighs 7 pounds. Cheese is used, doing away with poisons. This trap does its work, never fails and is always ready for the next rat. When rats and mice pass device they die. Rats are disease carriers, also cause fires. Rat catcher sent prepaid on receipt of \$3.00; Mouse catcher, 10 inches high, \$1.00. Money back if not satisfied. One of these rat catchers should be in every school building.

H. D. SWARTS, INVENTOR AND MANUFACTURER

Universal Rat and Mouse Trap

Box 566

SCRANTON, PA.

Healthy Trees Perfect Apples

when you spray with

"SCALECIDE"

—the spray that's endorsed the country over as "The one great dormant spray." Mixed 1 to 15, it kills every scale it reaches or you get your money back. Guarantee with every package. It's easily prepared, non-corrosive and non-clogging. 1 bbl. equals 3 bbls. lime sulphur. Destroys eggs, larvae and fungi in dormant state. Simple, safe, economical. Send for free booklet, "Scalecide, the Tree Saver." Write today, to Dept. D

B. G. PRATT CO.
50 Church St., New York City

HONEST TREES AT HONEST PRICES

Order your trees direct from longest established, most reliable nursery in the West. Save money—avoid disappointment. 500 acres—50 years thoroughly reliable dealings. Get our list and prices before you buy a tree : : :

THE
WOODBURN NURSERIES
Woodburn, Ore.

brown soap shaved fine and dissolved in water, or soft soap, or naphtha soap, or fish-oil soap dissolved therein. The third method is to spray with at least ten per cent kerosene emulsion, or one pound of fish-oil soap in five gallons of water, or one pound of ordinary soap in three gallons of water, or, perhaps best of all, with the combined nicotine extract and soap solution mentioned above.

"The spray liquid should also be directed to the base of the trunk of the tree, so it will reach the collar of the tree where the pests are liable to crawl down the trunk to get into the ground. Mound the tree with earth and spray the top of the mound, or pour some lime-sulphur solution or other spray liquid around the trunk or top of the earth.

"Remove the earth over the roots and see if the woolly aphis is at work on them. If so, cover the exposed roots with fine tobacco dust or pour over them one of the spray liquids mentioned above and replace the earth."

The Baldwin crop of New York state has all been harvested. However, the crop of Baldwins is very light this year. Greenings were sold at \$2.75 to \$3.00 per box, A grade; Kings at the same price. Macintosh Reds sold as high as \$4.00 per barrel where the color was good. It is reported that a great many growers who are anticipating better prices in the winter and spring, have taken space in cold storage plants. In the state of New York practically all of the apples are sold F. O. B. alongside the railroad track. Very few shipments are sent out on consignment or sold through auctions.

In the Northwestern apple exhibit at the San Diego Exposition, is a splendid display of apples from the Wenatchee district. A whole earload of apples will be shipped to this exposition on November 6th from Wenatchee.

Omak, Washington, in the Wenatchee district, reports it will ship 200 cars of apples this week.

A NEW OPPORTUNITY IN THE WEST OKANOGAN IRRIGATION DISTRICT

9,400 acres bordering the Okanogan River will be irrigated with the completion of this project. This section combines the soil and climate of the most favored fruit growing districts of the state, with unusual opportunities for dairying and stock growing. A farm unit of 40 acres has been established and a price fixed on the excess acreage of land by the Board of Directors, which enables the homeseeker to purchase high class irrigated land at prices lower than prevailed twelve years ago in irrigated sections of Washington.

Send for our FREE publication with map and full description of country.

F. W. GRAHAM
Western Immigration
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"BLUE RIBBON"

(EXTRA FANCY)

"RED RIBBON"

(FANCY)

Quality Brands of Yakima Apples

When ordering apples specify Blue Ribbon Brand and be assured of the best the market affords. All apples packed under our personal supervision and inspection.

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AND PRICES

Yakima County Horticultural Union

FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON



Write to the Men Who Know

There is a great difference in spray pumps and spraying apparatus. One kind is made by practical orchardists and has been improved through over 20 years of orchard success. Write a letter or postcard to Morrill & Morley Mfg. Co. Find out about

Eclipse Spray Pumps

In use in more successful orchards than all other makes. Used by U.S. Department of Agriculture. Find out what Eclipse offers in more profits for orchards, vineyards or potato fields. Address

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Manufacturer
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your wants quickly, accurately and economically

We print "Better Fruit"

F. W. Baltes and Company
Portland, Oregon

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly.

SEND FOR BOOKLET

Arcadia Orchards Company

Deer Park, Washington



There is One Test

that, applied to a bank, determines to no little extent that bank's stability and standing in the community. It is the test of time. The bank that has passed through more than half a century has well withstood this test. Such is the record of this strong state bank, a pioneer in the financial field of the West. It is not difficult to appreciate the prestige that such an institution and its patrons enjoy.

Your commercial and savings accounts invited.

Oldest in the
Northwest

LADD & TILTON BANK
PORTLAND, OREGON

Capital and Surplus
Two Million Dollars

Oregon Nursery Company

ORENCO, OREGON

Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens, Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN FRANQUETTE walnut, recognized as the best walnut. Our large complete stock consists of varieties suitable for every kind of climate.

Write us about your wants before buying.

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The hotel which made Portland, Oregon, famous
Most Desirably Located. In the Center of Shopping and Theatre District
Covers a City Block.

Broadway, Sixth, Morrison and Yamhill Streets
European Plan—\$1.00 per day and upward

Write for Portland Hotel Booklet.

GEO. C. OBER, Manager

The Hood River Apple Growers Association reports a steady sale of apples of all varieties and all grades. However, the movement of low grades is the most rapid. There is a steady sale in a good way for extra fancies, especially of the winter varieties like Spitzenbergs. The very long keeping varieties like Newtowns have not yet been moved very extensively. Shipments are running about ten carloads a day since the beginning of the season, which started about the first of October. At this rate, the association will probably be sold out by the first of the year.

The Oregon Agricultural College has a very educational exhibit at the Manufacturers' and Land Products Show, showing the value and effectiveness of proper spraying for scab. The exhibit shows a display of apples which have been properly sprayed, with 91 per cent free from scab.

Hood River estimates the present apple crop at about 900 carloads, although there are some who think it may reach 1000 carloads. Last year the total shipment was a little over 1400 carloads, including what was shipped to Portland by boat.

The University Horticultural Society of the Ohio State University will hold the fifth annual show of fruit and vegetables during the first two weeks of December. As usual this meeting will be very instructive to the fruit and vegetable growers of that state.

National Apple Day was celebrated extensively in Chicago. Much credit is due to the efforts of Mr. Coyne, one of the most prominent fruit dealers and handlers of apples in that city.

Watsonville, California, reports a good crop of apples in the Pajaro Valley—somewhere in the neighborhood of 4000 cars.

Mosier, Oregon, reports about 30 carloads of apples this year.

Wenatchee reports it is shipping about 100 carloads every day.

Coming Events

Lewisston Livestock Show, Lewiston, Idaho, November 29 to December 4.

Pacific International Livestock Exposition, North Portland, Oregon, December 6 to 11.

FRUIT GROWERS Dehydrate Your By-Products

It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the best By-Product machine ever devised. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

For new descriptive booklet address

LUTHER MANUFACTURING CO.
San Francisco, California

PRINCE ALBERT

the national joy smoke

has brought back to the
firing line thousands of
old, friendly jimmy pipes!

Prince Albert puts pipes in the mouths of men—and keeps them there—men who believed they never would, *never could*, again be tempted! To them Prince Albert has been as much of a revelation as *it will be to you!* The patented process fixes that—and cuts out bite and parch!

You don't have to sit and ponder over whether you can chum-it with a pipe or makin's cigarette; *you'll get that information* for a nickel or a dime! For Prince Albert costs you only those little sums for liberal supplies that will put you straight on the tobacco question.

You take a lot of stock in what we say on P. A.—just like you believe in ten-dollar-bills! For *we know* what we tell you about Prince Albert is right; *we know* how this tobacco will sit on your smokeappetite!

Just the right thing for you to do quick as you read this is to make tracks for that old pipe or land on the makin's papers, some P. A. and start action, for there's more joy due you instantly than you can shake a stick at!

Prince Albert is sold everywhere in toppy red bags, 5c; tidy red tins, 10c; handsome pound and half-pound tin humidors—and—that fine, dandy crystal-glass humidor with sponge-moistener top that keeps the tobacco in such perfect condition.



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R. J. REYNOLDS TOBACCO COMPANY, Winston-Salem, N. C.

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

THE WORLD

OUR ORCHARD

STEINHARDT & KELLY

One Million Dollars in Box Apples

It is something to be proud of to have the first call from almost all of the best growers of the West and Northwest, who know what we require and that we can use the largest quantities of the very finest fruit they raise.

They come to us year after year to give us preference in prices for these good reasons:

FIRST—We can dispose of larger quantities of their fruit than any other house in the country.

SECOND—We have been their best patron for many years and have always met our obligations punctually.

THIRD—We have more actual consumers of fruit, who keep on coming to us year after year because we take the best care to satisfy their wants and requirements.

FOURTH—Taking our entire holdings we handle more high-class stock than any house in the country.

FIFTH—We personally select our fruit in the growing centers, not so much with the sureness of profit as for the certainties of excellence and the belief that we know what our trade deserves.

SIXTH—The growers from whom we purchase get ideas from us as to what the very finest trade want and they know that we have helped raise the standard of excellence of the fruit industry.

But as to being proud—we are most proud, not only of our customers, but also of the growers, without whose help our efforts would be practically in vain.

We believe we have succeeded in assembling under our direction the very best packs of box apples from the premier districts of the Northwest.

We desire to herewith mention the names of a few concerns whose output we handle on this market:

NORTH PACIFIC FRUIT DISTRIBUTORS and Allied Associations

NORTHWESTERN FRUIT EXCHANGE and Allied Connections

CASHMERE FRUIT GROWERS' UNION

PESHASTIN FRUIT GROWERS' ASSOCIATION

WENATCHEE GROWERS' EXCHANGE

HOOD RIVER FRUIT GROWERS' EXCHANGE

SEBASTAPOL APPLE GROWERS' UNION

MOSIER FRUIT GROWERS' ASSOCIATION

WENATCHEE VALLEY FRUIT GROWERS' ASSOCIATION

YAKIMA FRUIT GROWERS' EXCHANGE

YAKIMA COUNTY HORTICULTURAL UNION

RICHEY & GILBERT, North Yakima

E. E. SAMSON CO., North Yakima

SPOKANE FRUIT GROWERS' CO.

Etc., Etc.

Steinhardt & Kelly

NEW YORK

OUR MARKET

THE WORLD

BETTER FRUIT

VOLUME X

JANUARY, 1916

NUMBER 7

SPRAYING ANNUAL

With Special Features on Other Vital Problems
of the Fruit Grower



Engraved by
Hicks-Chatten Co.
Portland, Oregon.

SPITZENBURGS

Grown extensively only in the Northwest, rated 10 by the American Pomological Society, indicating perfection for excellency of flavor, quality and other respects. The Spitzenburg is at its best for consumption from October to January, but preserves its excellent qualities much longer on cold storage.

"Health's best way
Eat apples every day"

Buy them by the box

"An apple a day
Keeps the doctor away"

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

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3 POINTS



- 1 EASY TO HANDLE
- 2 COSTS LESS
- 3 ALWAYS THE SAME

LILLY'S SOLUBLE SULPHUR

(COMPOUND)

How to Spray for Scale

"For such insects as San Jose Scale, which is a formidable pest because of the rapidity of its breeding, **EVERY PIN-HEAD of SURFACE ON EVERY TWIG** and branch must be covered by the spray. If even a few insects are missed, the pests may quickly develop as numerous as before. Many scales live in cracks in the bark or under buds. Such places are difficult to reach. Therefore **PRESSURE** spraying with Bordeaux nozzles is better than the low pressure mist obtained with Vermorel nozzles. Results are much better if the nozzle be set at an angle to the rod by an angle-joint, and the spraying be done from a height. Wetting **BEHIND the BUDS** is essential. **SPRAY EACH BRANCH FROM THE TIP TOWARDS THE BASE. DO NOT MISS THE ENDS OF THE BRANCHES.** Spray for the hardest places to reach. Do not be afraid to drench the trees, but trim and prune before spraying for economy of material. **SPRAYING IN A HALF-HEARTED MANNER IS GENERALLY NO BETTER THAN NO SPRAYING AT ALL.**"

1-lb. can	\$0.20
10-lb. can	1.25
100-lb. drum	7.50

Send for 1916 SOLUBLE SULPHUR BULLETIN.
It tells more about HOW to SPRAY.

LILLY'S, Seattle and Portland

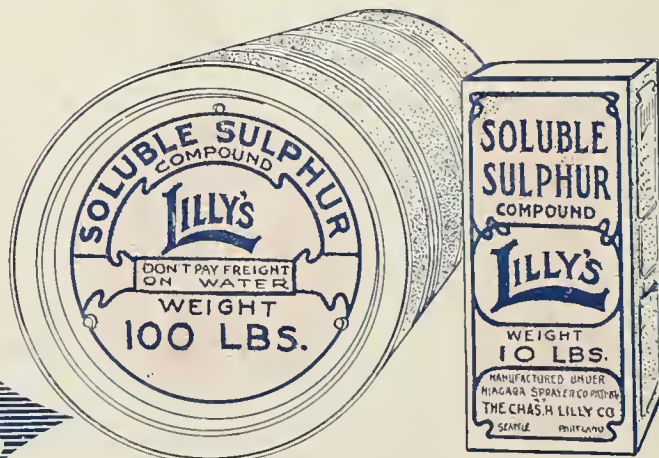
You Have Scale!

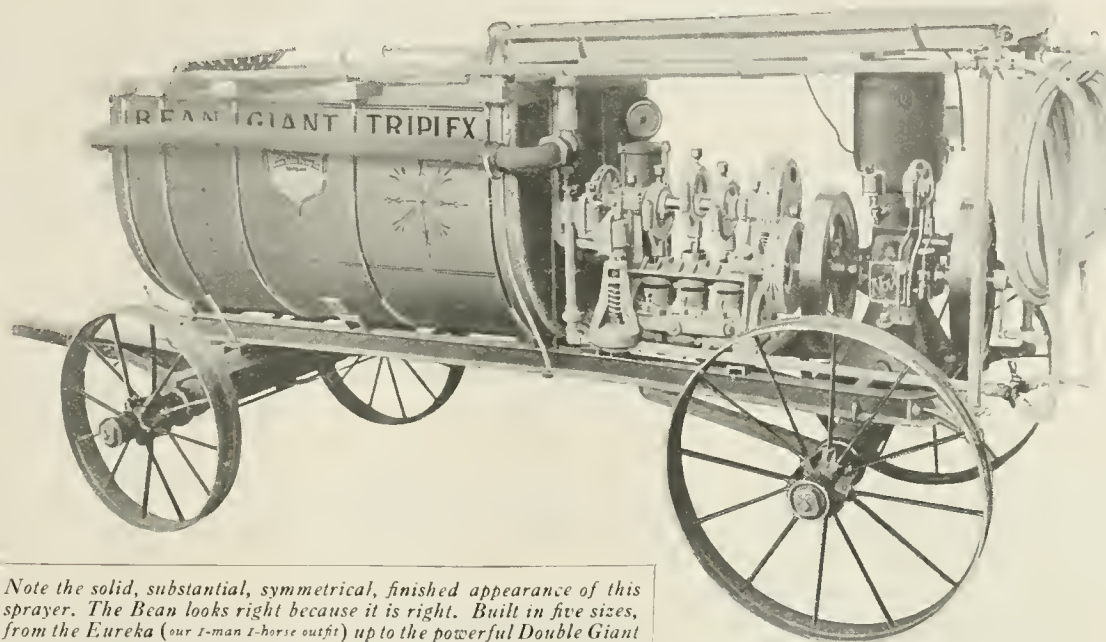


READ PARAGRAPH FROM
PULLMAN BULLETIN OF 1910.

Don't Blame the Spray. Did You Spray this Way?

Exact scientific tests show
Soluble Sulphur 98% to 99% effective.





Note the solid, substantial, symmetrical, finished appearance of this sprayer. The Bean looks right because it is right. Built in five sizes, from the Eureka (our 1-man 1-horse outfit) up to the powerful Double Giant

Thirty Years of Experience are Back of This Rig!

The Bean Line is not the creation of a day. It is the result of many years of sprayer-building. First came the Porcelain-lined Cylinders—then the Threadless Ball Valves—then the elimination of the Stuffing Box—then the adoption of eccentrics instead of cranks—one improvement after another—until today the Bean is everywhere known for its Ten Big Outstanding Features, as well as scores of lesser advantages, that are the result of our 30 years of constant betterment. Nothing has been overlooked or slighted that might add to the efficiency and reliability of

Bean Power Sprayers

Of all the many improvements that have been made in the Bean Line, perhaps none has created so much interest or worked such a distinct revolution in the building and operation of power sprayers as

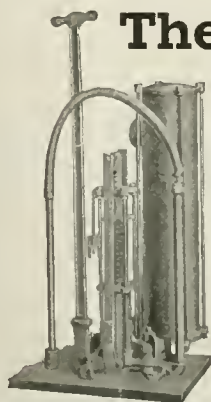
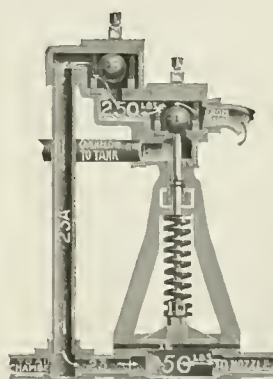
The Bean Patented Pressure Regulator

THIS FEATURE eliminates safety valve troubles, besides saving a large part of the fuel and much wear and tear on engine and pump.

NOTICE THE ILLUSTRATION. The spring (1D) is adjusted to the pressure desired. Now, if a nozzle is shut off, the increasing pressure on the diaphragm (1E) over-balances the spring and lifts the lower valve (1) off its seat, permitting the liquid to return direct to the tank.

THE ENGINE IS THEN ALMOST IDLE, simply lifting the liquid from its level in the tank and pouring it back again. Immediately upon the opening of the nozzles, the diaphragm drops back again, permitting the lower valve to close, so that the liquid is forced out through the upper valve (1C) to the air chamber and nozzles.

HAVE YOUR DEALER demonstrate this feature. He will be glad to do it. If there's no Bean dealer in your town our salesman will call.



The Bean Magic Hand Pump

Here is the most wonderful hand pump on the market—the only hand pump, in fact, that can be continuously operated at high pressure without exhausting the operator.

THE PATENT SPRING DOES HALF THE WORK. As you pull the handle toward you the spring is compressed and the liquid is admitted to the cylinder. As you push the handle away, the spring expands and helps to force the liquid into the air chamber against full pressure. The handle works as easily one way as the other.

Mail This Coupon Now For Our Complete 1916 Catalog

It describes the Bean Line for 1916, and explains the new improvements offered this season. The largest, most profusely illustrated, and finest catalog we have ever offered. A postcard will bring it.

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I have _____ acres of _____ trees.
Please send me your new 1916 Catalogue.
and am interested in more especially in _____
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ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.

ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.

ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

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Capital \$100,000.00

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WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

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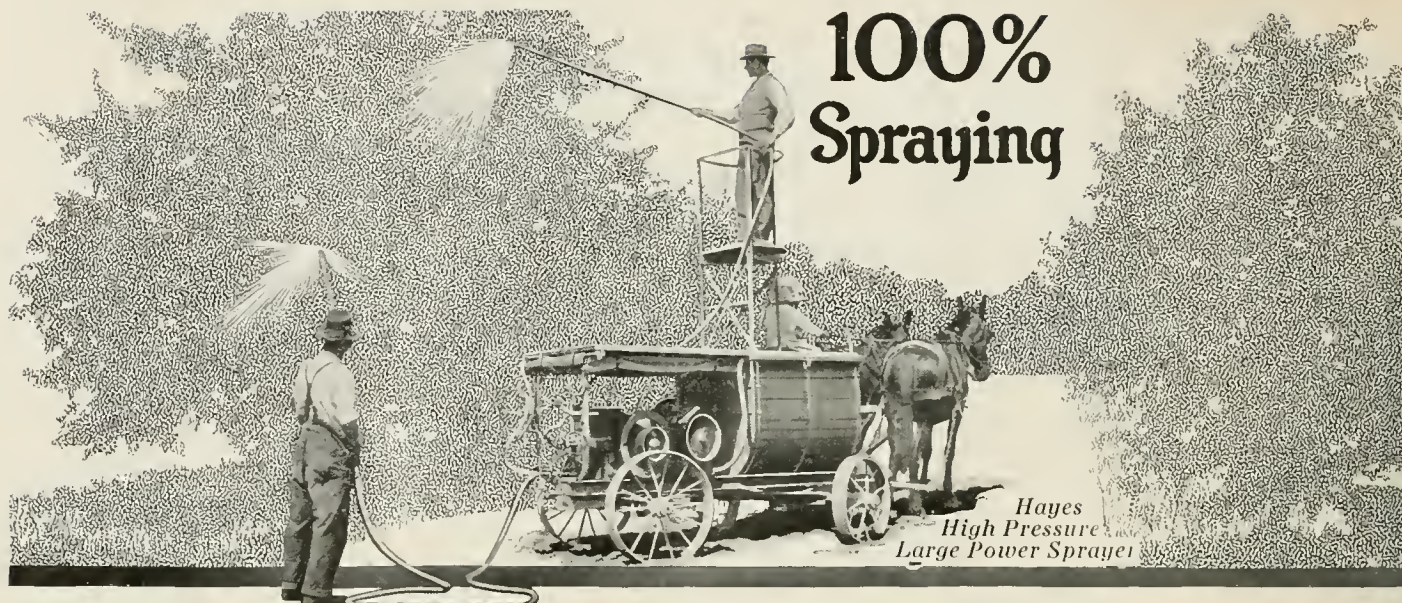
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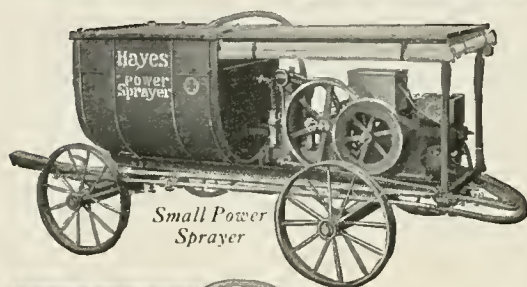
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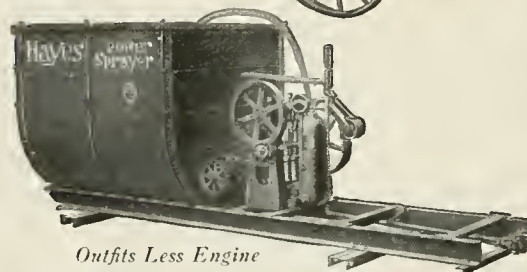
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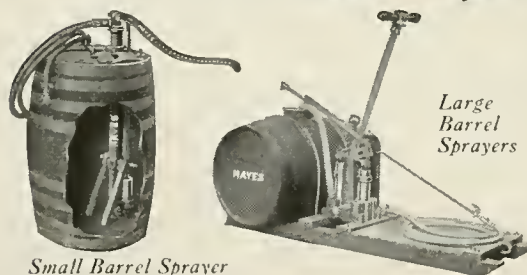
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High Pressure
Large Power Sprayer



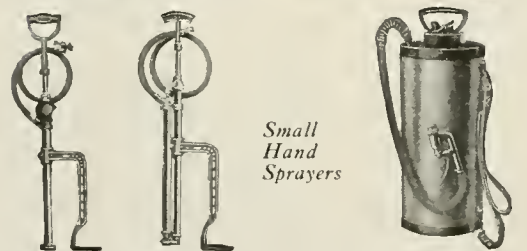
Small Power
Sprayer



Outfits Less Engine



Large
Barrel
Sprayers



Small
Hand
Sprayers

HIGH-PRESSURE Spraying is plus spraying—it is 100% efficient. The keynote of successful spraying is thoroughness, and thoroughness means 100% clean fruit. Every cider apple, blight-eaten pear or scaly peach increases the cost of production and lessens the quantity of salable fruit. High-Pressure completely atomizes the solution into a penetrating, fog-like mist that *seeks* out and *adheres* to every particle of foliage. It reaches protected pests that lurk in the innermost crevices of the bark, under bud scales and beneath the fleshy stamens of the apple blossoms, and easily controls those on the outside surface. Mere "sprinkling" at low pressure will not give practical control.

Hayes Hand & Power SPRAYERS

Not only does High-Pressure spraying insure a better quality of fruit but requires less solution, less time to apply, hence lessened cost. A High-Pressure Power Sprayer will pay you bigger dividends than any other orchard investment you can make.

HAYES Power Sprayers are tested to 500 lbs. and are *guaranteed* to maintain 300 lbs. working pressure. They are built for constant operation at high-pressure and enduring service. This not only requires the most thorough mechanical construction but the highest grade materials, hose and fittings.

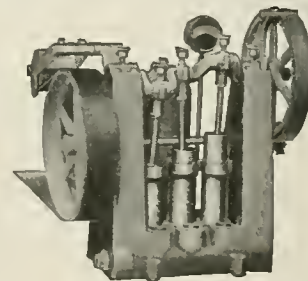
HAYES Hand Sprayers are built to give maximum pressure and capacity with minimum power to operate. It is economy to buy a good sprayer, capable of developing high pressure, easy-working, long-lasting and exempt from breakage and expensive delays.

HAYES Sprayers meet all the requirements of the modern orchardist, from small hand outfits to the largest high-pressure power sprayers built.

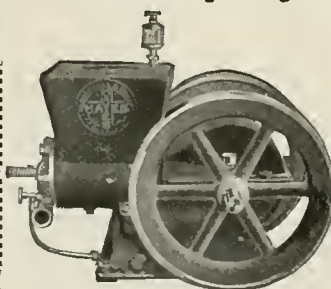
50 Styles. We manufacture 50 styles of large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, disinfecting, painting, farm, home and garden use. Complete outfits or separate spray pumps, hose, nozzles, fittings, bamboo rods, etc. Complete stock carried at Eastern, Central and Western distributing points.

Write: Send for Free Book 32 on High-Pressure Spraying and complete catalog. While investigating sprayers, you can't afford to overlook this modern and scientific line. *Write today, then you won't forget.*

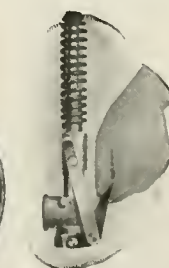
Hayes Pump & Planter Company, Galva, Illinois



Triplex Pump



Special Spray Engine



Quick Throw Off
Relief Valve



100% Nozzles and Fittings

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Hayes Pump & Planter Company, Galva, Illinois

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I am interested in: ☐ Small Hand Sprayer
☐ Large Hand Sprayer ☐ Small Power Sprayer
☐ Large Power Sprayer ☐ Nozzles and Fittings

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Some Horticultural Field Notes for the Season of 1915

By T. O. Morrison, Assistant State Commissioner of Agriculture, in charge of Division of Horticulture, Olympia, Washington.

CODLING MOTH SURVEY.—On September 20th, I began a codling moth survey of the districts of Wenatchee, Yakima, Kennewick, Walla Walla, Kettle Falls, Spokane, Clarkston and White Salmon to get in writing, as near as possible, the detailed operations of a large number of farmers as to their methods for codling moth control. It has taken a great deal of work and diplomacy on the part of the field inspectors to get these records, and a good many days and evenings, too, have been spent in the office studying and compiling this information. This season has been an almost unprecedented one for codling-moth injury. A great many farmers insist that the poor results in their arsenate sprayings this season are due to inferior lead arsenates. Personally I am of the opinion that the methods of application and the time of doing it have been more important factors than the chance of poor leads.

In making these summaries figures have been taken from surveys from all parts of the districts and it seems should represent fair averages. Not all of the orchards surveyed have been used in the general compilation, some being discarded on account of their location being between uncared-for orchards, or in isolated districts where infestation is not bad when no sprays are applied, or the orchard is young. The object was to get a fair summary which would show the average conditions where codling moth exists. The compilation of these surveys has been made usually by localities as the blanks were received, and in the case of the Yakima Valley three summaries have been made, one for the valley in general, one for the lower valley and one for the upper valley. In most localities our inspectors have placed codling moth breeding cages in order to observe the condition of the moths and determine spray dates. In this survey these spray dates are accepted as correct.

Fourteen orchards in the Grandview and Zillah districts having 455 acres of apples in bearing were tabulated. Of this number eleven were sprayed with power outfits and pressure ranging from 180 to 250 pounds before the calyx closed. Three were late in applying the calyx spray. Thirteen used the Bordeaux type of nozzle for the calyx spray. One used the Vermorel throughout the season. That the calyx spray was quite effective is shown by the calyx infestation at picking time, which averaged less than 1.34 per cent. There

were but three growers who repeated the calyx spray within ten days.

In spraying for the first brood of worms, seven were late in making the application, four were right, one early and two did not spray. For the second brood, eight were wrong, four were right and two did not spray. Three sprayed in August. The amount of lead averaged about two pounds per fifty gallons of water, and ranged from one to three pounds. At picking time

the average per cent for these fourteen orchards was 1.34% calyx wormy, and 27.6% side worms. Of these fourteen orchards five were clean cultivated, nine had cover crops of either alfalfa or clover. In eight of these orchards the spray for the first brood of worms was delayed until the crop of alfalfa could be cut and taken out of the way. One of the nine farmers did not allow the cover crop to delay spraying for the first brood. This



FIGURE 41—A five-year-old Yellow Newtown tree. It was pruned rather heavily each year until a year ago, when no winter pruning was afforded. When compared with Figure 43, a tree of the same variety and same age, it shows how light as opposed to heavy pruning tends to throw a tree into bearing. Note the many fruit-spurs on the two-year-old wood. During the preceding season a large part of the energies of the tree were devoted to fruit-spur formation.



FIGURE 12—A closer view of a portion of the top of the tree shown in Figure 11. It shows the tendency of unheaded shoots to develop large numbers of fruit spurs. Notice that a spur has developed from nearly every node on the two-year-old wood, and this in the top of a young tree of a variety normally slow in coming into bearing.

average per cent of infestation of side worms is 16.8%, and the average for the eight who delayed this spray is 31.1%. The number of moth sprays during the season averaged 3.5 applications. Six and seven-tenths (6.7) gallons per tree was the average for the fourteen orchards at each application.

At Wenatchee the inspector made a survey of 33 orchards with an acreage of 437½ acres. Of this number thirty sprayed before the calyx closed, using power outfits with pressure ranging from 175 to 250 pounds. There were three growers who repeated the calyx spray in ten days. For the 33 orchards the percentage of calyx worms at harvesting time was 2.2%. Three of these growers did not spray for the first brood of worms, twenty were right and ten wrong in the date of application.

For the second brood ten did not spray, seventeen were right and six wrong in the date of application. Seven sprayed during the first half of August. Mildew sprays were quite generally used during the season in combination with lead arsenate. Two farmers used atomic sulphur, one used Black Leaf 40, seventeen used iron sulphide and

nine used no materials in combination with lead. Of these orchards twenty-nine were sprayed throughout the season with Bordeaux type nozzles, eight were calyx sprayed with Bordeaux nozzles, and cone nozzles were used in later sprays. Four used Vermorel nozzles for all sprays. Six brands of lead were used at the average strength of 2.1 pounds per 50 gallons of water.

At picking time the average percentage for these thirty-three orchards was: calyx wormy 2.2% and 22.8% side worms. Of these orchards seventeen were clean cultivated and sixteen had cover crops. In seven of these orchards the spraying for first brood of worms was delayed until the crop of alfalfa could be cut and taken out of the way. Nine of these farmers did not allow the cover crop to interfere with the time of spraying for the first brood of worms. The number of moth sprays during the season averaged 2.9 applications per orchard. Five and four-tenths (5.4) gallons per tree per application was the average for the 33 orchards.

In making the following summaries, figures were taken from 79 orchards in

all parts of Yakima County, from the Selah and Naches to Grandview. Some orchards on which records had been taken were not used in the summaries for obvious reasons. One or two were discarded because, on account of their location, surrounded as they were by unared-for orchards, they could with the utmost difficulty be kept clean, even with the most efficient sprayings. Some of the orchards in the upper Selah Valley and on Tieton Ridge were discarded because they were young orchards, surrounded either by other young orchards or isolated so that even with no spraying they could not be as bad as some other orchards in less favorable locations would be with several sprays. The object was to get a fair summary which would show the average conditions where codling moth exists. From my own observations as well as from the figures obtained, I am positive that the chief reason for the unsuccessful work of the growers of the Yakima Valley is, first, lack of thoroughness in spraying, the second failure to spray at the right time:

CALYX SPRAY.

Used at the right time.....	75
Used too late.....	2

LATER SPRAYS.

Used at the right time.....	30
Used at the wrong time.....	18
Per cent of calyx worms where calyx spray was used at right time.....	0.6
Per cent of calyx worms where calyx spray was not used at right time.....	3.0
Per cent of side worms where later sprays were used at right time.....	5.1
Per cent of side worms where later sprays were used at wrong time.....	20.3
Per cent calyx worms where pressure was up to standard in calyx spray.....	0.7
Per cent calyx worms where pressure was too low in calyx spray.....	1.1

In these records the percentage of calyx worms is very low, but doubtless would have been considerably larger if there had been any way of computing the number of calyx worms in the apples which dropped and those that were taken off in the course of thinning.

Twenty-five orchards were surveyed in the Cashmere district, comprising 321.5 acres. Of this number twenty-one sprayed before the calyx cups closed, and four were late in applying this spray. Power outfits in each case were used and pressure ranged from 150 to 300 pounds. Two orchards were sprayed again within ten days of the calyx spraying. Six were right in spraying for the first brood of worms, eleven were wrong and eight did not spray. For the second-brood spray, four were right, seven were wrong and fourteen did not spray. Ten used iron sulphide and one Black Leaf 40 in combination with lead arsenate. Seven sprayed for moth during August. The average number of gallons per tree was 4.7. Twenty-four of these orchards were sprayed with Bordeaux type of nozzles and one used Vermorel for all sprays. Four used cone type of nozzles for later sprays. Four brands of lead were used at the average rate of 2.1 pounds per 50 gallons. At picking time this fall the average percentage of infection for the 25 orchards was: 2.02% of calyx wormy for fifteen orchards

with the remaining ten reported "almost none," and 21.2%, the average per cent of side infestation. Thirteen had cover crops and twelve were clean cultivated. Seven of the nine in cover crops were delayed in spraying for the first brood of worms on account of the crop.

In the lower part of the Yakima Valley survey was made of twenty orchards, comprising 688 acres. Three of these were sprayed too late for a good calyx spraying, the other seventeen spraying with good pressure while the calyx cups were open. But four repeated the calyx spray in ten days after first application. In spraying for the first brood of worms nine made the application at the proper time, according to the inspector's spray dates, eight were wrong and three did not spray. For the second brood of worms, six were right, nine were wrong and five did not spray. Six growers out of the twenty used sprays in combination with arsenate of lead. Six of the orchards were sprayed for moth in August. The amount of spray solution used at each application averaged 5.6 gallons per tree, of arsenate of lead solution of 1.9 pounds average strength per 50 gallons. The number of sprayings averaged three and one-fourth times during the season. At picking time an estimate of the amount of codling moth infestation averaged for the twenty orchards 1.34% calyx and 15.5% side-worm infestation. Cover crops of alfalfa, clover and vetch were grown in fourteen orchards and was the cause of some delay in spraying eight of these for the first brood of worms.

Codling-Moth Summary

To read over carefully the survey reports of the 181 orchards surveyed is sufficient to convince one of the great variety of conditions that apparently had some bearing on the general unsatisfactory results obtained this season from codling-moth sprays. It is doubtful if there is any one important point that would explain the cause, except possibly for a few orchards. After studying over these records I am all the more convinced that lack of uniformity in doing the work throughout the districts is the first general suggestion that I have to make as one of the causative factors. Practically all of these orchards were sprayed uniformly with high pressure before the calyx cups closed, and the average low percentage of calyx wormy apples is proof that the calyx spray certainly was effective. The very large percentage of infestation at the side of the apple and the lack of uniformity in applying the later sprays certainly leaves room for improvement. The harvesting of the cover crop, which is usually alfalfa, comes just at the time when the spray for the first brood of worms should be applied, and many farmers have allowed this to postpone spraying.

In many orchards the crop was relatively light and the spraying of such orchards was not always done as thoroughly as it possibly should have been



FIGURE 13—A five-year-old Yellow Newtown tree. It has been pruned rather heavily each year. Last year it received a light thinning out and a comparatively heavy heading back. When compared with Figure 41, a tree of the same variety and same age, it shows how heavy pruning tends to stimulate vegetative growth as opposed to fruit production. Note that there are comparatively few fruit spurs on the two-year-old wood. It has been made to devote its energies mainly to shoot formation.

done. During the year 1914, the Wenatchee Valley growers used 323,333 pounds of lead, and only 242,277 pounds this season, which was hardly in proportion to the increase of bearing acreage and size of trees. The 1914 crop was heavy, and many wormy apples were allowed to rot in the orchards and around the packing houses, thus carrying over an unusually large number of moths. Usually a winter of alternate freezes and thaws is fairly disastrous to insect life unless well protected. Last winter was pretty cold, but was not a winter of alternate freezing and thawing. Observations made on the Sherman ranch in Fruitvale, near North Yakima, on March 31st, showed live codling-moth larvae under the tree bands. On April 2nd the inspector found live larvae under the bark of apple trees in the Enclid district. This would indicate that the extreme cold of last winter did not destroy many, if any, codling-moth larvae or pupae. During the first week of August of this year codling-moth eggs were in evidence throughout the

Yakima Valley, and were no doubt the cause of a large percentage of stung apples. The cause for this season's heavy infestation would seem to be the result of a series of conditions, beginning with the left-over wormy apples of the 1914 crop and continuing up to the 1915 picking season. Although it will not stand the test in every case, the grower who has carefully watched spray data, sprayed thoroughly and kept his apples protected with the poisonous film throughout the growing season has secured best results.

Pear Blight (*Bacillus Amylovorus*)

The dreaded pear-blight disease has been doing its work in certain districts of the state since 1910. The excitement and realization of its seriousness probably reached its zenith during the growing season of 1914. The feeling among the mass of the growers will naturally decline now, but the disease is the same serious malady and all efforts possible should be made to encourage uniform control methods throughout the orchard districts. The notes on blight during the past growing season are

given in part here in order that we may become better acquainted with the progress of the disease from early spring to the end of the growing season.

First Flow of Blight Exudate

On March 19th, a Spitzenberg tree at Grandview showed signs of fresh oozing of blight exudate. On March 23rd, fresh exudate was found on Winter Nelis and Bartlett pear trees in the Broadway district near North Yakima. On March 27th more exudate was observed on other pear trees in the Broadway locality, and on the same date the first exudate for the season at Sunnyside was observed on one Jonathan and one Bartlett tree, and four days later was found on a Spitzenberg tree. It was expected that new exudate would become noticeable in the lower valley first, where the season is one to three weeks in advance of the upper valley, but the temperature records for March for Yakima give a mean maximum of 61.8 degrees, and a mean minimum of 36.4 degrees, and for Sunnyside a mean maximum of 62.4 degrees and a mean minimum of 35.1 degrees, which no doubt had much to do with the regularity of appearance of first new ooze in those localities. On April 1st, first new exudate was seen in the Selah district on one pear tree and new case was found April 7th on the Selah Extension. On April 5th, the first new exudate found in the Clarkston district was noted, and on April 6th exudate was found on Bartletts in the Euclid district, near Grandview. As early as April 10th a small percentage of hold-over cankers found in the vicinity of North Yakima showed signs of exudations, and by the 24th of April a good percentage of hold-overs found showed exudate.

New Infection

The first new infection of the season was observed on Winter Nelis blossoms in the vicinity of North Yakima April 24th, and at Prosser on April 20th. At that date this variety had been in bloom only a few days, but where hold-overs were found it was not a difficult task as a rule to find new infection of blossoms on nearby trees. Whenever blight shows up in a district it seems that there are always certain varieties that show heavy percentages of blossom infection, while other trees of different varieties growing among them may show no blight, or at least blight in small proportion to their neighbors. Although there are many factors entering into the probable cause, my observations during a number of seasons lead me to think that the limitation of the blossoming period and its relation to the abundance of blight exudate at that time is an important factor in causing infection to take place in some varieties to a greater extent than in nearby trees of different varieties. Bartlett pears at North Yakima were coming into bloom April 9th, and on the same date were practically in full bloom throughout the Grandview district. The amount of exudate exposed to the visitation of insects at that date

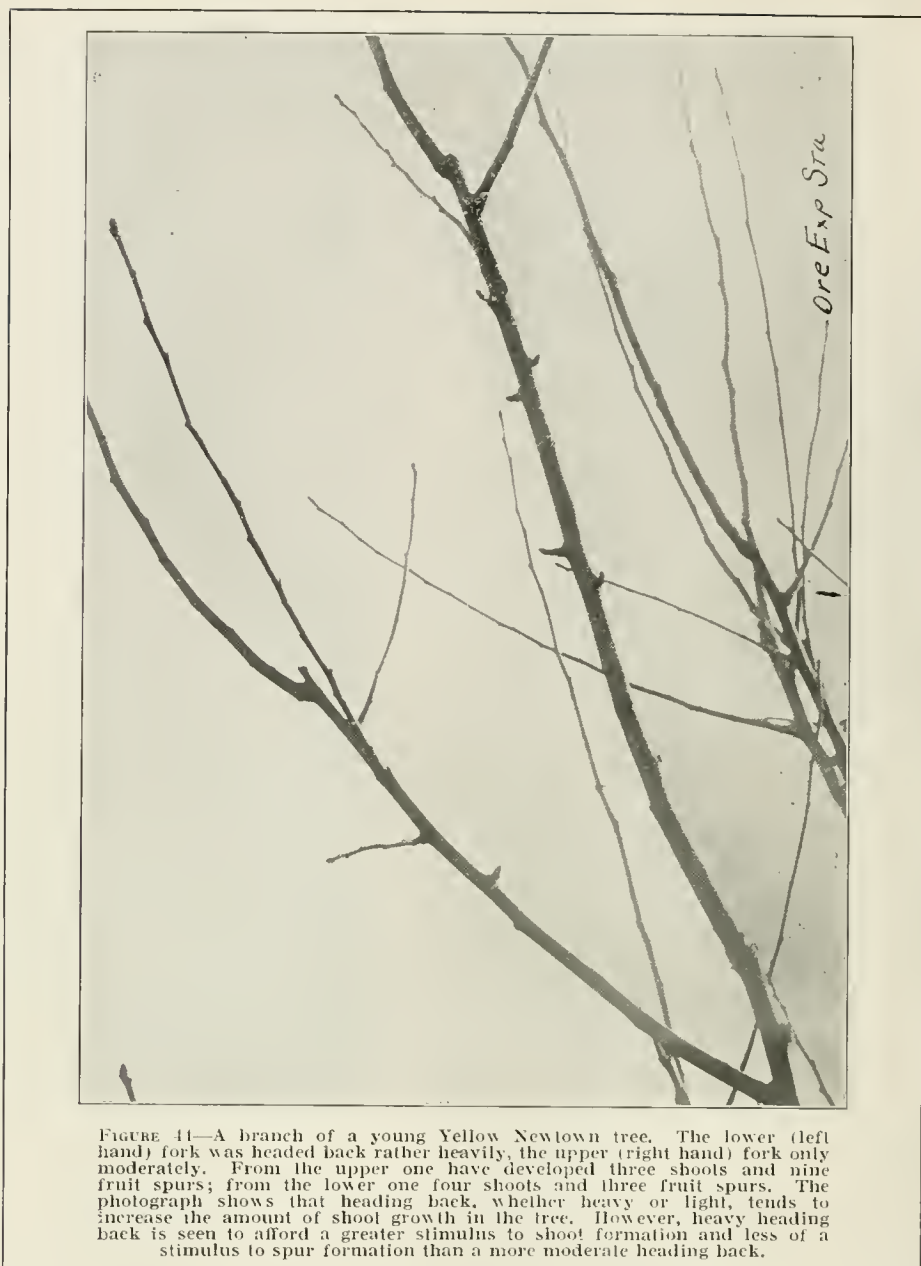


FIGURE 41—A branch of a young Yellow Newtown tree. The lower (left hand) fork was headed back rather heavily, the upper (right hand) fork only moderately. From the upper one have developed three shoots and nine fruit spurs; from the lower one four shoots and three fruit spurs. The photograph shows that heading back, whether heavy or light, tends to increase the amount of shoot growth in the tree. However, heavy heading back is seen to afford a greater stimulus to shoot formation and less of a stimulus to spur formation than a more moderate heading back.

was very small as compared to the amount exposed ten days to two weeks later, when most varieties of apples were in bloom. It is a well-known fact that the amount of infection in the regular blooming season is much greater in Jonathan and Spitzenbergs than in Bartlett pears, and the above dates would partially seem to explain this point. Bartlett trees that throw out later bloom are very susceptible to blight, which is probably due, first, to the greater abundance of exudate, and, second, to temperature conditions.

Early in May new blight became easily noticeable to anyone looking carefully for signs of it. On May 8th, new blight was beginning to show up at North Yakima on Spitzenberg, Jonathan, Rome Beauty and some Winesaps. On May 12th, new blight was showing up quite generally on Spitzenbergs and Jonathans. In spite of the fact that pears had bloomed heavily they were less seriously affected, no doubt due to the blooming season of

the pears being a little ahead of any general activity in hold-over cankers. A warm rain on May 15th, which was quite general throughout the Yakima Valley, apparently accelerated and promoted the spreading of blight infection. This humidity continued for several days and a week later it was reported that some blight had shown up in practically all districts in Yakima County. As early as the 22nd of May the inspector assigned to the Selah district reported the finding of serious infection in Winesaps and Delicious. New blight was showing up plentifully in the vicinity of Walla Walla May 13th, and some new infection was observed by the middle of May in the vicinity of Dayton and Clarkston. Up to May 29th the new infection of Spitzenbergs and Jonathans was almost entirely fruit-spur infection, but Rome Beauties were beginning to show some tip infection. One interesting point was reported on May 20th to the effect that infection that had reached the base of fruit spurs

was apparently traveling faster across the limb than up and down the limb from the fruit spur.

The first new blight in the Wenatchee district was reported to have been found May 22nd and 29th in the Nahaham and Brender Canyons on Jonathan and Bartletts. Just why the amount of blight exudate was so small in the Wenatchee district and had the relatively small percentage of blossom infection I am unable to say, unless the difference in temperature conditions, as shown by the Weather Bureau's records, was a factor.

June and July were months of unusual blight activity in the districts

affected by blight. On June 16th, it was observed near North Yakima that blight was apparently making entrance at the base of leaf petioles, and on July 9th Dr. Hotson observed and later determined the presence of blight infection on the outer margins of pear leaves. On September 18th, the inspector reported observations of many invasions of the leaves in the Spokane district. The specimens were sent to Dr. Heald, plant pathologist at the State College, where it was reported for a certainty that the blight had made its entrance through the leaf apparently without the aid of insects or mechanical injury. In the Selah district blight

infection was observed on pear fruit on May 12th, which apparently became infected from the dripping of blight ooze. That drupaceous fruits may sometimes become infected with pear blight has been proven. On June 19th, the inspector found four young prune trees at College Place, near Walla Walla, infected with tip blight. Specimens were sent to Dr. Heald of the State College and he determined the infection to be that of ordinary pear blight. During June Dr. Hotson, at North Yakima, proved that cherry fruit could be inoculated with the pear blight organism and has cross-inoculated several times with Boyal Ann tips.

Pruning the Bearing Apple and Pear Tree

By Professor V. R. Gardner, Oregon Agricultural College, Corvallis, Oregon.

IN presenting this subject it is assumed that the trees have been brought to bearing age. They have been trained as open-center, closed-center or modified-leader trees, as the case may be. They have been given their general shape and consequently little attention will need to be devoted to the question of training them. The little training that will be required will be incidental to the main problem of pruning to influence fruit production. After trees have been brought to bearing age there is little argument as to what the main objects of pruning should be. They are, first, to obtain large quantities of fruit, full yields for the size of the trees in question; second, to obtain better fruit, the best that can be grown under the conditions in question; third, to obtain these large yields and high grade at the lowest possible cost.

The Ideal Fruit-Spur System

As has already been pointed out in a previous article, the fruitgrower obtains the most of his fruit through the medium of fruit-spurs. In other words, fruit-spurs are the main fruiting mechanism, or main fruit-producing machinery of the trees. The questions, then, to consider are: What constitutes an ideal fruit-spur system and when is that fruit-spur system in an ideal producing condition. In the first instance we want many spurs. This does not mean, necessarily, the largest possible number of fruit-spurs for any given space, but we must have a great many or else we cannot obtain a large number of fruits, for ordinarily a single spur does not produce more than one high-grade fruit in one season. Frequently several fruits set on a single spur, but in the better-managed orchards these are thinned to one, which is allowed to mature. We want not only many spurs, but it is desirable that each spur be strong and vigorous. It seems reasonable that a strong, vigorous spur not only will produce better fruit than one which is weak, but it will also be more regular in its bearing; and regularity of bearing of individual fruit-spurs is as important from the viewpoint of annual yields as the

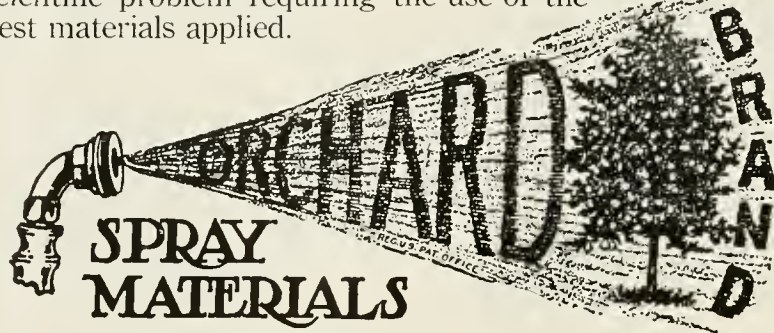
number of fruit-spurs present. A regularly bearing fruit-spur in the case of apples and pears is one that bears once in every two years. It cannot be expected to bear every year, for normally a fruit is produced from a terminal bud one season and the next season is required to prolong the spur from a lateral leaf bud so another terminal flower bud can be formed the follow-

ing year. The spur which bears in 1915 can reasonably be expected to bear again in 1917. However, the trouble with a large percentage of fruit-spurs, especially in older trees, is that they do not bear every other year. Instead they bear but once in three, four, five or, in some cases, eight or ten years. This irregularity of bearing generally is due to a lack of vigor on the part of



FIGURE 45—A young apple tree showing the effect of very heavy heading back. In this case the pruner cut back into two-year and three-year-old wood. Fruit spurs that had started to form were forced out into shoots. The entire energies of the tree have been temporarily turned into shoot formation. Age of bearing has probably been delayed two years by the treatment.

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Light Heading Back vs. Heavy Heading Back

Pruning of bearing trees almost necessarily consists in one or another of two practices, heading back or thinning out, or in a combination of the two. In regard to heading back, two questions arise at once: First, what is its influence upon the number of fruit-spurs that will develop, and, second, what is its influence upon the length of life and regularity of bearing of already formed fruit-spurs? As heading back may be either light or heavy, and as we would naturally expect different results from a heavy than from a light pruning, let us first consider the probable effect of a light heading back. By light heading back we will assume that there is meant a thirty per cent cutting back of the shoot growth of the past season. This would mean that a shoot having ten equally-spaced lateral buds would have the upper three removed under ordinary circumstances. The probable effect of this light heading back would be that one to three, probably two, of the uppermost buds remaining would be forced out into shoots the following summer. Some of the lower buds, let us assume three, would be forced out into fruit-spurs; and still others, two, in the case that has been assumed as typical, would remain dormant. That these probable results of a light heading back may be more easily compared with the probable results of other types of pruning, let us multiply

the individual spur, though perhaps the tree as a whole would be regarded as vigorous. The case is one of trees possessing fruit-producing machinery, but the machinery is in poor condition, unable to turn out its full quota of work.

Furthermore, we desire not only many and regularly bearing fruit-spurs, but they must be long-lived. Even if there are some spurs formed each year, and if these were to bear regularly for three or four seasons, the large bearing tree might soon come to have too little fruit-producing machinery for large yields if the spurs died when four or five years old. Furthermore, the rapid dying off of spurs in the older parts of trees would soon result, first, in a large amount of barren wood, and, second, in the clustering of the live spurs near the ends of the smaller branches, where the load of fruit can least easily be supported. Ordinarily the fruit-spur that lives for twenty years and produces ten fruits is twice as valuable as one that lives half as long and produces five fruits.

Influence of Pruning Practices Upon the Fruit-Spur System of the Tree

With the ideal fruit-spur system in mind, we are ready to ask these questions: How do pruning practices, as commonly employed upon bearing trees affect this mechanism for fruit production? What is their influence upon the formation, regularity of bearing and length of life of the individual fruit-spurs?



FIGURE 46—The top of an old Tompkins King tree. Moderate pruning two and three years ago stimulated the formation of a rather large number of medium long shoots. These shoots have not been headed back and have consequently developed large numbers of fruit spurs. A number of these small spur-bearing branches should now be removed in order to afford those remaining an abundant supply of light throughout their length. Thinning out is more needed than heading back in this tree top, though a limited amount of heading back will tend to keep the tree from growing so high.

the figures by one hundred, giving us the growth record from one hundred shoots, each with ten lateral buds. (It is of course not imagined that any bearing tree would present exactly the conditions here assumed. The shoots of trees are not of uniform length; all do not respond in the same way, even though pruned back relatively the same amount. Many factors enter to cause individual variation and the pruner will, to a certain extent, take these factors into consideration, pruning one shoot heavily to check or subordinate it, another lightly to encourage it, etc. Nevertheless there seems to be no good reason for believing that our theoretical example of a tree with one hundred shoots, each shoot having ten equally-spaced lateral buds, would behave in a manner materially different from trees as we find them. Indeed, it is believed that on the average they would behave alike. It is only by taking theoretical cases of this sort that a simple comparison of results between different methods of pruning may be readily made.)

From the one hundred old shoots we would obtain two hundred new shoots, three hundred new fruit-spurs, and have left two hundred dormant buds. It would seem that the net result of a light heading back is practically to double the original number of shoots, and also to develop quite a large number of new fruit-spurs.

Next, let us see what results we may expect from a heavy heading back. By heavy heading back we will assume that there is meant the removal of the terminal sixty per cent of the shoot growth of the season. Again assuming a tree with one hundred shoots, each possessing ten equally-spaced lateral buds, heavy heading back would leave four hundred lateral buds on the shoot growth of the past season. The comparatively heavy heading that these shoots would receive would have a tendency to force out a large number of the buds left into shoot growth, thus leaving a smaller number for the development of the spurs and a still smaller number to remain dormant than in the case of light heading back. Probably a year's growth on the one hundred heavily pruned shoots would result in approximately two hundred and fifty new shoots, one hundred and fifty spurs—fifty buds remaining dormant.

Comparing the results from light with those of heavy heading back, it will be seen that both practices result in a great increase in the number of shoots and also a moderate increase in the total number of fruit-spurs. Of the two practices, heavy heading back affords the greater stimulus to vegetative growth, but less of a stimulus to spur formation.

Light Thinning Out vs. Heavy Thinning Out

A light thinning out of the theoretical tree (we are assuming a thinning out that is equal in the amount of growth removed to the light heading back) would leave seventy of the one hundred

shoots, and these seventy shoots would not be pruned in any way. Each of these seventy shoots possesses not only ten equally-spaced lateral buds, as was

assumed before, but a terminal bud as well. When growth begins in the spring the terminal buds are usually the first to start, and it is a matter of

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FIGURE 47—An old Bartlett pear tree that has become filled with much-branched fruit spurs. Many of these spurs are very weak and lacking in vigor and produce flowers and fruit very irregularly, only once in five and ten years.



FIGURE 48—An old Bartlett pear tree that several years ago was in the condition of that shown in Figure 47. An attempt was made to reinvigorate its old weak spurs by "dehorning," a very heavy heading back of the top part of the tree. The result has been the formation of a large number of strong, vigorous shoots that in turn have developed many vigorous fruit spurs. However, the old spurs in the lower part of the tree have remained much as they were. They have not been invigorated to any marked extent. Thinning out instead of heavy heading back would probably have afforded very different results.

common observation that the main shoot growth of the season, in trees with non-headed shoots, develops from these terminal buds. In fact comparatively few of the lateral buds develop into shoots, most of them starting but only growing out into spurs. Were we to assume that from seven hundred and seventy buds, seven hundred lateral and seventy terminal, on the seventy shoots remaining after a light thinning, we obtain one hundred and forty shoots and four hundred and ninety spurs, leaving one hundred and forty dormant buds, we would probably not come far from what would be actually obtained.

A heavy thinning out of this same theoretical tree we are considering, a thinning out that would remove sixty per cent of the shoot growth of the season, would leave forty untouched shoots. Each of these would have a terminal bud and ten equally-spaced lateral buds, and would probably behave the following season in much the same manner as the unpruned shoots

of the lightly-thinned tree. Were this the case the result would be eighty new shoots (forty from the terminal buds and forty from as many lateral buds), about three hundred and twenty spurs and forty dormant buds. The individual shoots might be longer and stronger, and the individual spurs thicker and more vigorous in appearance, but probably the proportion of buds to develop into fruit-spurs would remain about the same.

When the results to be expected from a light thinning out are compared with those to be expected from a heavy thinning out, it is seen that the light thinning affords a larger number of both spurs and shoots, though it is reasonable to assume that the shoots will be shorter and the spurs somewhat less vigorous than those of the heavily thinned trees.

That the probable effects of these different pruning practices may be more readily compared, they are presented in tabular form:

TABLE II.—SHOWING PROBABLE RESULTS FROM DIFFERENT METHODS OF PRUNING ONE HUNDRED SHOOTS, EACH HAVING TEN EQUALLY SPACED LATERAL BUDS.

	Light (30%) heading back	Heavy (60%) heading back	Light (30%) thinning out	Heavy (60%) thinning out
Number terminal buds left	0	0	70	40
Number lateral buds left	700	100	700	400
Number new shoots formed	200	250	110	80
Number new spurs formed	300	150	490	320
Number buds remaining dormant	200	50	110	40

Heading Back vs. Thinning Out

If the results from heading back are compared with those from thinning out, it becomes evident that both processes tend to stimulate the formation of both new shoots and new fruit-spurs. However, heading back affords the greater stimulus to fruit-spur formation. This is true whether it is light heading back and light thinning out or heavy heading back and heavy thinning out that are being compared.

What has just been said regarding the influence of different pruning practices upon the formation of new fruit-spurs applies with almost equal force to their influence upon the longevity and regularity of bearing of already-formed fruit-spurs. It might be reasoned that heading back in general, and especially heavy heading back, because of its limiting the formation of new fruit-spurs, would tend to divert food material into those already formed and cause them to be more vigorous, more long-lived, more regular in bearing. On the other hand, heading back seems to show a tendency to divert food material into new shoots rather than the old spurs. These new shoots develop mainly in the outer and upper parts of the tree, leaving the spurs in the lower and inner portion in a weakened condition. The result is that they will probably bear less regularly and die earlier than spurs which have an abundant food supply. Furthermore, very heavy heading back will even force into shoot growth some of the already-formed spurs.

Thinning out, on the other hand, will not only divert an extra amount of food material into the older fruit-spurs on account of its reduction of shoot growth, but it also lets light into the center of the trees, so that the leaves of each spur are better able to manufacture the food materials needed to keep these spurs vigorous and thrifty. This should enable them to live longer and bear more regularly. Light thinning out probably affords the larger number of fruit-spurs, and heavy thinning out the stronger, more vigorous and long-lived ones.

Continued in next issue



Great Crops of STRAWBERRIES and How to Grow Them



A KELLOGG SUPERB EVERBEARING PLANT

Photographed September 15th, lower leaves removed to show berries. 14,000 hills may be grown to the acre. Each hill will produce about two quarts of big, fancy berries. 20 to 30 berries fill a quart box. The price ranges from 30 cents to 45 cents per quart. Fruits continually from June until November. Our free book tells the rest.

Let Strawberries Buy Your Home

THE best asset on earth is a share of the earth. Grow strawberries the Kellogg way and get your share. Strawberries give quicker returns and bigger profits than any other crop. The profit from a single acre of strawberries in a single season will pay for two acres of high-priced land. Many men and women are now paying taxes instead of rent from the profits of strawberries.

Only a few years ago Mr. E. D. Andrews, of Lansing, Michigan, was without a dollar. He now owns a fine home all paid for, valued at **\$4,000.00**. Just two acres of Kellogg pedigree plants—the Kellogg way—that's all. He says so.

At LaGrande, Ore., Mr. Z. Chandler started with less than one acre of Kellogg plants. In five years that short acre made him just

\$4,390.50. And now Mr. Chandler is paying taxes instead of rent. He sent for our free book, made the try for a home, and won.

These are only two of the many reports that come to us. These men are just common everyday fellows. What they have done you can do if you will make the try. Send for our free book and let us help you earn a productive home.

Kellogg's Everbearers

Kellogg's everbearing varieties fruit continually through June, July, August, September and October. Heavy frost does not check their fruiting. Three months after plants are set you will be picking big, red berries. These plants produce large, fancy berries in great quantities. Many growers are making at the rate of **\$1,000 to \$1,200** per acre the same season plants are set. These everbearers will produce more dollars per square rod and do it in less time than anything you can grow. Our **FREE** book pictures and describes seven of these varieties and tells you how to grow them.

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We want every farmer to get our **FREE** book and learn how to grow strawberries and how to add beauty, pleasure and profit to his home. It requires less work and less experience to grow strawberries than common garden vegetables. Strawberries yield more dollars per acre and give quicker returns than any other crop. Strawberries help the housewife to prepare her three daily meals and to earn her own spending money. Grow strawberries and get the boys interested in a profitable business that will keep them on the farm. Boys like to grow money-making crops. Let them join our Boys' Strawberry Club and win a prize. One acre of strawberries will yield a greater profit than 20 acres of common farm crops. Get our **FREE** book.

Kellogg's Free Service

When you buy Kellogg Pedigree plants you also get Kellogg's Service. Whether you grow strawberries for home use, pleasure or profit you get full benefit of our thirty-three years of strawberry experience. We never are too busy to answer questions. Our Service Department is on the job six days in the week and 52 weeks in the year. We make big money growing strawberries and we enjoy helping others make money. Strawberry growing offers a grand opportunity. The world is hungry for delicious strawberries. Let us help you satisfy the world's strawberry appetite. Get our **FREE** book and read the letters from both beginners and old-timers, who will tell about the benefits derived through our Free Service Department.

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A Kellogg strawberry garden will supply a large family with all the delicious strawberries they can eat summer and winter without cost. You can have strawberries picked fresh from the vines from June until November and canned berries, preserves and jam throughout the winter. Why should you pay a high price for common strawberries when you can grow the Kellogg kind right in your own garden or back yard? Our free book describes garden selections adapted to all soils and climatic conditions and shows beautiful pictures of the Kellogg gardens growing on the home grounds of customers. Get this book and learn how to supply your family free with the most delicious fruit that grows.

Great Crops of Strawberries and How to Grow Them

This is the best book on strawberry growing ever written. Worth its weight in gold. Used in agricultural colleges. Fully explains the Kellogg Way of picking two big crops from each acre each year—a big profit in the spring and a bigger one in the fall. Tells how to make rain when the sun shines and how the wonderful Kellogg Pedigree plants are developed on the great Kellogg plant farms in Michigan and Idaho. Step by step every detail of the work is explained in a plain and practical manner. Beautifully illustrated and easy to understand. You must read this book to appreciate its real worth. You will be delighted with the beautiful engravings of strawberries, strawberry fields and strawberry garden scenes made from actual photographs. This book gives you 64 pages of strawberry facts and 33 years of strawberry experience. A pleasant surprise and something you should know on every page. Get this book and learn the Kellogg Way. Make \$500 to \$1,200 per acre. The book tells you how. It is **FREE**.

R. M. KELLOGG COMPANY, Box 355, Three Rivers, Mich.

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The Famous Quality Line

The result of 28 years' practical experience in building sprayers. Hurst Sprayers have stood the test of time and stand today head and shoulders above all competition. The big success of the Hurst line can be summed up in one word "Simplicity." Every Hurst Sprayer is a marvel of simplicity. No unnecessary parts to cause trouble and annoyance. Combined with simplicity they have the greatest convenience and utility.

32 Different Styles Special Low Prices

A quality sprayer for every known need. Man, horse and gasoline engine power. Various sizes and styles of power sprayers, with and without engines. The Acme, shown below, is an exceedingly popular machine with the Western grower.

Get Our Big FREE Book

This book should be in the hands of every fruit grower and farmer. Used as a class book in many of the Agricultural Schools. Contains 74 illustrations and descriptions of insect and fungus pests and gives the remedy for each. Shows our complete line of sprayers.

Write us for a copy of this free book and name of nearest dealer at once. Get our prices before buying a sprayer. Deliveries from Portland and other Western points. Live dealers wanted everywhere.



The H. L. Hurst Mfg. Co. 8230 North Street
Canton, Ohio

This Book
FREE



to a Bean 3-inch pump, and a 25-h.p. Bean engine belt connected to a 6-inch Bean pump. These various outfits could be switched on or off at will, thus permitting the visitors to see the different combinations in operation.

The company's exhibit embraced a full line of their hand and power sprayers, including the Bean Magic, the wonderful little high pressure hand pump; the Bean Nursery Sprayer, a recent addition to the Bean line; the Bean Double Giant, a new outfit more powerful than anything in the way of a power sprayer hitherto made, and other outfits included in the new Bean line for 1916.

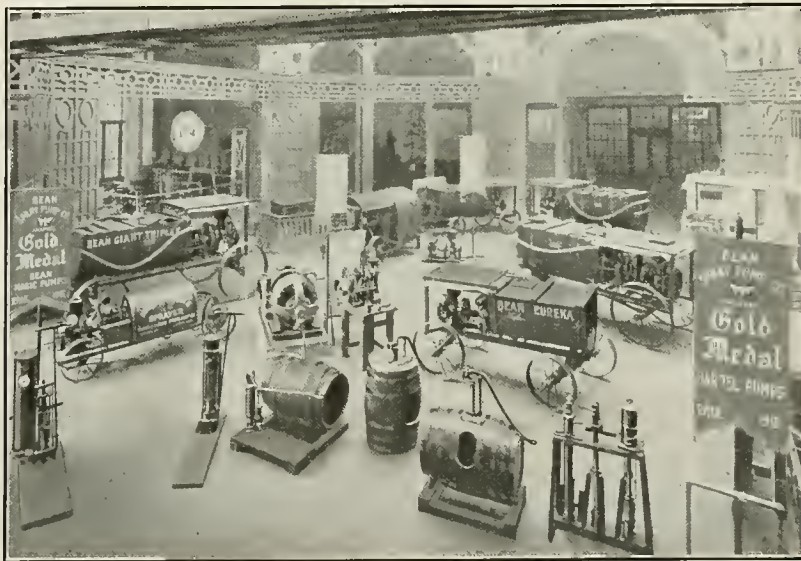
The exhibit was always a center of interest for visiting fruit growers, and representatives of the company were kept constantly busy explaining the various Bean features and demonstrating the different outfits.

A feature that never failed to command attention was the Bean pressure regulator, a vast improvement over the old style safety valve, and one which the manufacturers have clearly proven reduces the wear and tear on the engine and pump by nearly half, at the same time saving a large percentage of the fuel.

The Bean Spray Pump Company has just issued a complete new catalog, the largest and finest book of its kind ever issued by this firm. It is profusely illustrated and embraces the complete Bean line, from the smallest hand pump up to the new Double Giant. The catalog will certainly be of interest to every fruit grower, and a copy will be mailed to all who address the Bean Spray Pump Company at San Jose, California.

This article would not be complete without mention of the new, finely equipped offices and stockroom that have replaced that portion of the Bean plant at San Jose which was destroyed by fire several months ago. Before the ashes were cold plans were under way for reconstruction, and the burned structure has been replaced with one considerably larger and better. It is a notable fact that the fire, though of considerable extent, did not seriously delay deliveries of the company's products; that part of the factory unharmed having been put into operation within twelve hours after the fire. The plant is now protected by a modern sprinkling system, and a repetition of the disaster is practically impossible. The rebuilt plant is one of the most convenient and efficiently equipped of its kind to be found anywhere.

The Washington State Penitentiary has just placed with the Shady Brook Milling Company of Walla Walla an order for Shady Brook Dairy Feed enough for the next six months. They have a fine herd of Holstein cattle.



Herewith we show a view of the exhibit made at the Panama-Pacific Exposition by the Bean Spray Pump Company, of San Jose, California, and Lansing, Michigan.

The grand prize, the highest award in the hands of the international jury, was given to the Bean power sprayers. In addition to the grand prize the concern received a number of gold medals and other awards.

The Bean Spray Pump Company is well and favorably known throughout the Northwest as manufacturers of spraying outfits, and this recognition of

superiority by the exposition judges will not be a surprise to those who are familiar with the high-grade outfits that are put out by the Bean factory.

The central feature of the display was a beautiful waterfall, the water being carried to the top of the falls by a Bean pump, and rushing down over the rocks in foaming cascades, it was returned to the reservoir, from which it was again pumped to the falls. Three different outfits were rigged up for pumping the water: a 10-h.p. Bean engine direct connected to a 4-inch Bean pump; a 5-h.p. motor direct connected

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—declared to be "The Finest Apple in All the World" by Luther Burbank, "The Wizard of Horticulture." "Stark Delicious" is an apple in a class alone. A great big, flashing red apple of exquisite flavor—with a spiciness unknown in any other variety. Crisp, fine-grained, juice-laden flesh. "Simply Delicious" in fact as well as name.

And it is as profitable as it is good. The sturdy, genuine "Stark Delicious" trees, propagated in our century-old nurseries, produce enormous crops for owners of both home and commercial orchards everywhere.

Get a copy of our Centennial Fruit Book—our 100th Birthday Gift to you—and learn why this great apple and genuine "Stark Delicious" trees are prized by men like Col. G. B. Brackett, U. S. Pomologist; Prof. H. E. Van Deman, Ex-U. S. Pomologist; Col. R. H. Dalton (who made \$20,000 from his 1915 apple crop), Benj. Douglass, one of Indiana's leading apple growers, Thomas F. Rigg, owner of Iowa Experiment Grounds, and hundreds and hundreds more.

Get this book to get the benefit of the experience of these and scores more of America's successful fruit growers. It will be sent as—

This Big 100th-Year Book pictures and describes the Best Fruits of All Varieties—Apples, Peaches, Pears, Plums, Cherries, Apricots, Quinces, Grapes, Berries, Currants, Asparagus, Rhubarb, Nuts, Roses, and Ornamental Vines, Trees, Hedges and Shrubs.

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A book that will delight the heart of everyone who loves Nature's most beautiful things—stately trees, graceful shrubbery and hedges, glorious roses. A book that will interest—inform—inspire you—and show you how easily and economically

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Read this NEW, BIG, BEAUTIFUL, 12 by 9 inch, 4-COLOR BOOK—just off the press. This big 100th Year Book pictures and describes the Best Fruits of all Varieties—Apples, Peaches, Pears, Plums, Cherries, Apricots, Quinces, Grapes, Berries and Currants, Asparagus, Rhubarb and Nuts also. And a big section of the book devoted to Roses and Ornamental Vines, Trees, Hedges and Shrubs, too.

A magnificent specimen of printing art, and a bird's-eye view of fruit developments for the past hundred years. Filled from cover to cover with life-size, natural color photographs of leading fruits—actual photographs of orchards and fruit trees that have yielded and are yielding their owners fortunes. Every page bristling with profit-making facts and hints and pointers that will help you and every owner of either a little or a big orchard.

Write for this superb book now whether or not you are ready to buy trees. Stark Bro's and each of their men, the fruit specialists of America, want you to have a free copy.

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 1816—1916
AT LOUISIANA, MO.

MYERS

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You must spray to have perfect fruit. You must spray to save your trees. To wage war successfully on fruit tree pests modern fighting equipment is required. Myers Spray Pumps are the 42-centimeter guns that produce havoc in the ranks of the insect hosts. Last summer's continued rains were especially favorable for the development of fungus diseases, making it doubly imperative for you to spray, if the healthy condition of the trees is to be preserved.

New Myers Automatic ELIMINATES PRESSURE TROUBLE



Myers Power Spray Outfits are made in various sizes, with pumps for belt, gear or pitman drive. All will operate successfully under any conditions and give entire satisfaction. You can bank on that. Myers Bucket and Barrel Sprayers and Hand Outfits are unusually well constructed. Built with the Myers Patented Cog Gear Head, they are so easily operated that they can be used where other styles could not even be considered. In fact they possess that something in superior quality and construction that cannot be found elsewhere.

Our Sp15 Catalog will tell you all about modern spraying machinery and also how and when to spray. Write for a copy today.

IT WILL SOON BE TIME TO SPRAY



F.E. MYERS & BRO.
ASHLAND, OHIO.
ASHLAND PUMP AND HAY TOOL WORKS
120 ORANGE STREET

How Spray Kills

By Dr. A. L. Melander, Entomologist, Head of Department of Zoology, Washington State College.

SPRAYS that are used to control insects do not all work alike. Those containing arsenicals must be eaten by the insect in order to destroy. Others, like oil emulsions, tobacco and sulphur-lime, kill when in contact with the insect's body, by a process of suffocation. Some sprays have a disagreeable taste and prove effective as a repellent, rather than as a poison, the insects going hungry rather than to eat the bad-tasting spray. It is the repellent action of sprays that is little understood, much neglected, but nevertheless most important. Bordeaux spray, sulphur-lime, tobacco, oil emulsions, soaps and lime, our commonest spray materials, are all repellants to chewing insects. This should be borne in mind when compounding mixtures of several sprays. It is not alone the chemical reaction that must be heeded in combining sprays, nor also the possibility of foliage injury, but the physiological reaction on the insect must be considered as well. A newly-hatched codling worm is a delicate

little creature. It has a selective appetite and does prefer to feed within the pulpy calyx end instead of on the tough skin of the apple. If its first meal is distasteful, the young codling worm has been seen to reject it, working the nibblings out of its mouth by a secretion of silk. This is probably always the case where the apple is heavily coated with arsenate of lead, or where lime, bordeaux spray or sulphur-lime have been added to the poison. Thus it is that late sprayings lack effectiveness, even when the fruit is whitened by the spray. Most of the entering worms manage to swallow some of the poison, however, enough to kill them after a few days, but in the meantime the apple is "stung," the worm penetrates a short distance and the fruit becomes as valueless as if it were badly wormy. Apples "stung" at the calyx end are rare when plain, weak arsenate of lead alone is used. It is easily conceivable that a calyx spray, much stronger than one or two pounds to the fifty gallons, would prove increas-

ingly less effective, and evidence seems actually to point this way. Calyx worminess is customary where the dust spray, a lime spray or a combination with fungicide is used.

An insect's sense organs are very different from our own. Its tasting is done by little finger-like appendages, which vary in structure with the species. Things distasteful to us are not necessarily shunned by insects. For instance, ants will eat quinine but will reject glycerine, and flies will drink formaldehyde until they drop dead. Bordeaux spray is highly distasteful to most grasshoppers, leaf-eating beetles and cutworms, but there are some cutworms on which it seems to have no effect. An insect is not a feeding machine that must scrape off and swallow whatever is on its food. It is a living organism gifted with powers of discrimination keener than any we possess. We have but to recall how certain insects are restricted to certain food plants, displaying a knowledge of plant species more astute than that of a professional botanist. The least we can ask, therefore, of a stomach poison is that it shall be tasteless and fine grained, so that the insect

Continued on page 28



Harness is like a leather boot—if you don't keep it oiled, it rots. Moisture that works into the pores of your harness robs tugs, straps and breechings of the strength they need to give you good long service.

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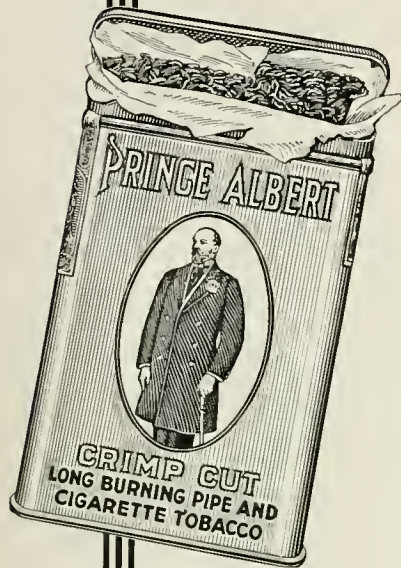
keeps the pores of the leather filled with highly waterproof oils—keeps your harness soft, pliable, strong. Have your harness man dip your harness occasionally, or apply it yourself by hand. Harness costs money. It doesn't pay to neglect it.

Standard Oil Company
 (California)

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Prince Albert paves the way

for men to get a new and cheerful understanding of how good a pipe or rolled cigarette can be. If you *think* you can't smoke a pipe or a makin's cigarette; if you are taste-tired, we tell you Prince Albert will bring you back without any fuss or feathers—quick! The patented process fixes that—and cuts out bite and parch!



PRINCE ALBERT

the national joy smoke

has everything any man ever yearned for in a pipe or rolled cigarette. Its flavor is as refreshing as it is delightful; and its aroma, coolness and non-biting qualities will certainly make you realize you have lost a lot of good old smoking time!

Don't *think* about this tobacco question any longer. *Decide now* you will try Prince Albert! Just you see for yourself that all the good things we say about P. A. will more than prove out to your tongue and taste!

Buy Prince Albert everywhere tobacco is sold in topsey red bags, 5c; tidy red tins, 10c; pound and half-pound tin humidors and in that classy pound crystal-glass humidor with sponge-moistener top that keeps the tobacco in such fine trim.

**R. J. REYNOLDS
TOBACCO CO.**

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Official Organ of The Northwest Fruit Growers' Association

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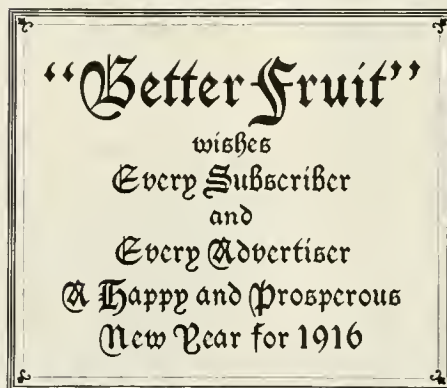
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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

A National Advertising Campaign for the Northwest.—During the National Apple Show an idea was presented to the Northwest, consisting of the States of Washington, Idaho, Oregon and Montana, of engaging in a general advertising campaign, for the purpose of advertising the Northwestern box apples. The suggestion was made that it would be advisable for the growers to consider such a proposition, and it was also stated that if such a proposition was undertaken that one cent per box would be required in order to raise a fund sufficient for anything in the way of a national campaign. It was stated at the Conference in Spokane that this suggestion would give the apple growers throughout the Northwest an opportunity for studying and discussing the plan among themselves, it being the intention later to present something definite in the way of a plan at a meeting of the Fruit Growers' Council, which will probably take place in the month of January. Various opinions and ideas exist in different districts and even among fruit growers in the individual districts. It is the view of some that each district should spend its own money to advertise its own particular brands, while it is the view of others that if a large percentage of the growers would contribute one cent a box an increased sale for Northwestern box apples could be created, the distribution widened and the markets extended. There are a great many districts in the Northwest which so far have failed to get together and all agree on any one plan. Many ideas have been advanced, a great many of which have cost money without realizing any better prices for the grower. Such are some of the expressions of opinion of the different growers in different districts. The plan

as suggested calls for a committee to be composed of one representative chosen by the Chamber of Commerce of Spokane, one representative to be chosen by the Chamber of Commerce of Seattle, and one representative to be chosen by the Commercial Club of Portland, it being intended that this committee should go into the matter in detail and work out a definite plan of advertising and superintend all expenditure of the advertising appropriation. At the present time, from the various opinions expressed and the various attitudes of the different growers and marketing



concerns, the conservative individual, the one who has not taken any definite stand, generally feels and expresses himself that such a campaign, calling for a contribution of one cent per box, must be definite in all of the main particulars and the growers assured that all money will be conservatively and wisely handled, with every assurance of creating an additional sale for Northwestern box apples, widening the distribution and extending the markets, before any large percentage of the growers will be induced to agree to contribute one cent per box for this

Selling ^{is} your Salvation

*You must sell
at a profit
or
quit the game*



*Well dressed
packages
attract
attention
—
Induce sales*

OUR ATTRACTIVE LABELS
ARE YOUR SILENT SALESMEN

SCHMIDT LITHOGRAPH CO.
SAN FRANCISCO.

Los Angeles, Fresno, Portland, Seattle, Salt Lake City

purpose. And even so, it must be admitted that some individuals and a large percentage of some districts will even then be unwilling, feeling that they can spend their own money best in their own way. The Sellers' League, composed of representatives of the different selling concerns, met in conference in North Yakima to consider this and other important matters, the third week in December, without arriving at any definite conclusion, finally agreeing before making any definite recommendation to await the result of the survey of the apple industry that is being made in the Northwest by government officials. This is simply a general statement of the attitude, opinions, problems and accomplishments up to the present time in reference to the contribution of one cent per box for the national advertising campaign.

The National League of Commission Merchants will hold its twenty-fourth annual convention at Indianapolis January 12 to 14 inclusive, headquarters having been arranged for at the Hotel Claypool. The scope of the league's operations and representation extends to forty-two of the largest and most important fruit distributing centers in the United States. A cordial invitation is extended to all kindred organizations, fruit growers, shippers, representatives of the press and anyone that directly or indirectly is interested in the fruit industry. While the Editor of "Better Fruit" has attended and addressed the Western Fruit Jobbers' Association and the International Apple Shippers' Association, he regrets he has never had the pleasure of attending one of the conventions of the National League of Commission Men, which are said to be very instructive and interesting and of such nature as to justify every fruit grower attending who can possibly

GOOD BYE—RELIEF VALVE!

The New Myers Automatic Pressure Governor Pump

100, 150,
200-Gal.
Tanks

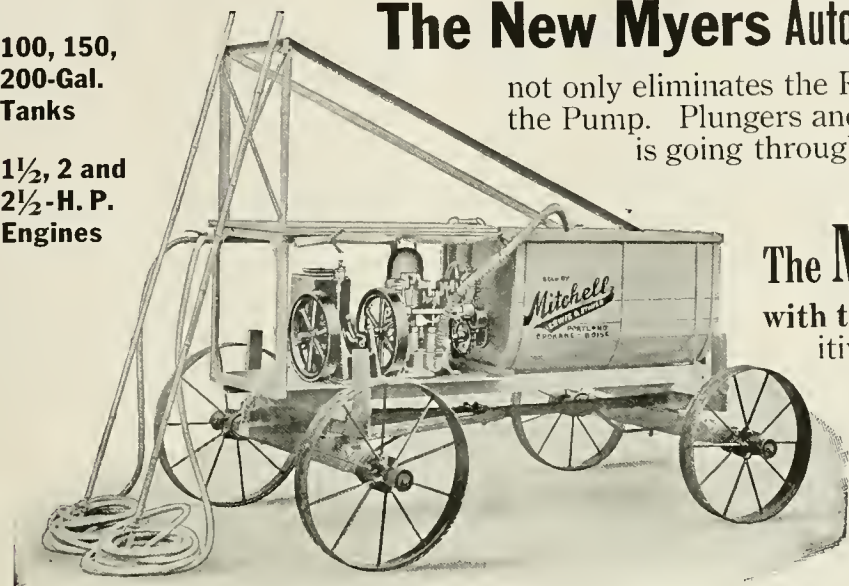
1½, 2 and
2½-H. P.
Engines

not only eliminates the Relief Valve but prolongs the life of the Pump. Plungers and Valves not in action unless spray is going through nozzles.

The Myers Power Sprayer

with the Stover Engine for Power is positively the best Spraying Rig possible to build.

Light Draft and Cutaway Harrows Myers Spray Pumps



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FREE BOOKLET.

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Here is my name for your FREE Sprayer Booklet

Name

P. O.

spare the time. The program this year is especially instructive. The social feature promises entertainment that will be very delightful, not only for the men, but also for their wives. One of the main features of the program will be Organization and Co-operation. It will be of special interest to the fruit growers of the Northwest to know that Mr. Wilmer Sieg, sales manager of the Apple Growers' Association of Hood River, six or seven years ago was president of the National League of Commission Merchants for two terms in succession, and was recently elected an honorary member, being the only honorary member of the National League of Commission Merchants.

Orchard Units.—During the past few years many purchasers were told that a splendid living could be made on a very small unit—of five or even two and one-half acres. Now that fruit growers have had time to reflect and have had an opportunity by experience to judge of the possibilities on small tracts, there is a reaction in the opposite direction and an earnest endeavor to get at the logical economy unit. The Editor has never favored anything smaller than a ten-acre tract, which if properly handled will probably pay a good profit on the amount invested. There are strong arguments held out in favor of even larger units, of from twenty to forty acres, for which the following reason is given. With a large unit the grower is enabled to engage in

some line of diversity, therefore is not entirely dependent upon his orchard for his living and other expenses, and there is no question about the advisability of the fruit grower diversifying to a reasonable extent.

Dissatisfaction.—There is no denying the fact that considerable dissatisfaction in the fruit industry has existed among the growers of the Northwest during the last few years. There is nothing strange about this, except that the fruit grower sometimes thinks that he is the only one that is suffering and either forgets or is not aware of the fact that all lines of business have been suffering under the very strenuous depression during the past few years. Usually the fruit grower's lot is really not so very much different, in the fact that he has not been making very much money because other lines of endeavor in the business world are in the same boat. Then too, again, fruit growers must remember that every product of the soil some time during the past few years has gone through a period where it did not pay the cost of production.

Among the different diversities that may be mentioned for the fruit grower are dairying, hogs, cattle, truck gardening, etc., all of which can be combined by different individuals with the orchard industry. One man may be suited to one line of business and have an opportunity to engage in that line and make a success, while another man

will be suited and know more about some other line of farming. One piece of soil may be suited to one diversity crop, and another piece of soil may be adapted to another diversity crop. Therefore it is up to the fruit growers to determine what kind of a side line or diversity the soil is adapted to and what he himself is suited for. If this is intelligently determined, then diversity lines will be a success and a great help to all fruit growers.

Stabilizing the Orchard Industry.—Previous to 1912 there was an extensive setting of apple trees. This was largely brought about by the fact that the Northwest produced very fine fruit and the growers who were in the business had been making good money. A large part of the extra setting is undoubtedly due to the fact that much unreasonable boosting was done, particularly by those engaged in selling orchard lands, and on account of the fact that unreasonable representations were made to growers about the profits that could be made. It is true that considerable orchard land was bought on speculation, and it is also true that many American people rapidly change from one business to another, going from what they are engaged in to what looks more appealing or encouraging. All of these causes have been factors in stimulating the setting previous to 1912. But the orchard industry of the Northwest is rapidly stabilizing itself. Already much of the acreage planted in unde-



Our Motto

HIGHEST QUALITY:**OUR 1916 ANNUAL CATALOG**

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sirable locations has been eliminated. There has been no great quantity of setting since 1912, and as the trees come into bearing at about eight years of age the maximum of production will probably be reached in 1920. In all probability, on account of elimination of acreage for various reasons, the maximum may be reached before that time. It looks very much as if the orchard industry will be stabilized much sooner than many people anticipate.

The Orchard Unit.—The minimum or maximum of the orchard unit will depend very much upon the ability of the fruit grower as to how intensely he can cultivate his land and how capable he is. We frequently see truck growers

making more out of two or five acres of land, or even berry growers or fruit growers, than the general farmer makes off of three hundred acres.

Future Production.—There is no question about the fact that a great many orchards have suffered from neglect during the past two or three years. This is more particularly true in some districts where opportunities have not been favorable than in others. It is very evident to those who have investigated the matter that there will be a considerable reduction in acreage due to the fact that more or less has been neglected during the last few years. It is the same in the orchard industry as in all other lines of business—those

who attend to business, who have good orchards of the right varieties and well located, will succeed. The invariable rule, "The survival of the fittest," applies in all lines of business.

The Western Fruit Jobbers' Association of America will hold its twelfth annual convention in Memphis, Tennessee, January 16 to 20. A very interesting program, both along business lines and in a social way, has already been prepared, assuring everyone who attends an opportunity to secure a lot of information about the marketing end of the fruit industry, as well as a splendid good time. The Editor attended and addressed the convention held in Sacramento, and feels justified in advising every fruit dealer and every grower who can possibly attend the convention at Memphis that it is an opportunity he cannot afford to miss, if he can spare the time and the money to attend.

At a meeting of the Shippers' Council attended by a number of prominent representatives of fruit-shipping interests, which was held in North Yakima December 18, it was decided to postpone a reorganization of the Northwest Fruit Shippers' Council, and the convention also decided to postpone the proposed advertising campaign of the Northwestern box apples until after a survey of the situation by representatives of the United States Department of Agriculture was completed. The four representatives of the government meeting with the Shippers' Council were J. C. Gilbert, C. E. Bassett, W. H. Kerr and C. W. Moomaw.

Losses in Orchard Investment.—There is no question but what there have been some losses in orchard investment, but these have really been due in a large measure either to poor judgment in making the investment or to a desire to speculate on the part of the purchaser. These losses are not different from the losses that are taking place in all other kinds of investments throughout the United States. The desire to speculate, even to gambling, has never been controllable. Millions of dollars are lost in mining property without ever a whimper, but if a man loses a few dollars in an orchard investment there is a kick.

Mercantile agencies put down among the reasons for failure, as one of the largest causes, the lack of knowledge about the business engaged in. This applies to the fruit-growing industry, because many people have gone into the business without knowing anything about it. After getting in it they have not devoted the time and study necessary to learn the business to be successful.

Attending to Business.—After some thirty years' experience in business the Editor has finally arrived at the conclusion that success in a very large measure depends upon attention to business. In fact, the man of ordinary ability who attends to business will succeed, while the smart man who does not attend to business will fail.

Friend Sprayers

you knock off the crate, put on the wheels and drive into the orchard.

The most remarkable line ever offered by a company whose outfits have always deserved the highest respect of the fruit growers. Every machine is both tested in the testing room and given a working tryout before shipping. So when it is received Complete directions accompany each outfit.

Friend King

For extensive work where it is necessary to carry a large amount of spray material into the orchard. Large wheels, wide tires, two-horse draught, cypress tank of 200-250 gallons capacity, propeller agitator which will keep arsenate of lead in suspension, directly connected with pump shaft. Motor pump unit saves space. Keeps bearings and gears in alignment over rough ground. Is rigid and secure, as it sets on common base bolted to wagon bed with four bolts. Every part accessible. Step platform; steel track; narrow bed for short turning. Western tread, enabling use in potato fields. Motor pump supplied with suction hose, so hose can be removed and pump cleaned. Recommended for use in orchards of ten acres or more. Delivered complete with whiffletrees, neckyoke, tower and two hose lines.

"I have been busy spraying with two 'Friend' Kings for over a week in our orchards—and the more they run the better they work. Our neighbor's old sprayer gave out on him and I am sending him over a 'Friend' to finish the job. The calyx nozzle is a wonder, and I am using only two to an outfit where I have been using four angle nozzles before. They put it through a tree with from 200 pounds to 300 pounds pressure."

H. C. Goodwin, Avon, Va.

Friend Queen

Queen is the low-down, cut-under model—underslung, so called. It has all the capacity that KING has in every way. Owing to its UNIQUE construction, its close coupling, the large wheels and wide tires, it is very easy drawing. The fifth wheel is flexible, permitting the machine to go over uneven ground without any probable misalignment of the bed or working parts. The machine was designed many years ago. Everything about it is thoroughly tried—nothing experimental whatever. The tank is CYPRESS. The propeller agitator direct connected. The latest WESTERN, our LARGEST capacity, HIGH PRESSURE unit motor pump is used on both King and Queen. With the Queen outfit it is possible to turn square around, there being no under brace to conflict. The center of gravity of this machine is so low that it is impossible to overturn it on the steepest hillside. Both King and Queen are furnished when specified with towers for tall trees, although in most orchards a man standing on the top of the tank can reach with the spray all right. The motor pump on QUEEN is very accessible—the horses can be turned to one side, giving the operator perfect freedom. QUEEN is very easy to work around; it is so low for filling.

"I know my Queen has pumped more 'stuff' than any other sprayer on earth and it still runs fine."

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LIGHTEST KING is the SMALLEST, LARGE capacity, LIGHT weight, HIGH pressure power sprayer ever produced. Very popular for combination field and orchard work. The tank holds 100 or 150 gallons; the motor pump has two hose line capacity at high pressure. The truck is LIGHT, all steel, DURABLE, flexible fifth wheel. The machine is equipped for one or two horses, equipped with one or two hose lines. A tower is also furnished where desired; also field attachment for spraying potatoes and all field crops. The agitator is propeller type, direct connected, no gears or chains. Everything is the very latest and BEST, even the pressure regulator. The tank is CYPRESS. LIGHTEST KING has a very low center of gravity and cannot overturn. The equipment is complete—everything ready for service.

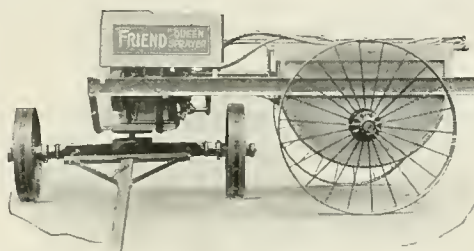
"The Lightest King works fine and does the work well; we have enough power to use four lines of hose if necessary." So write Fay Brothers, of Cooperstown, N. Y., on July 14, 1915, and again on August 18 say: "I could not convince any more of the hop growers that they ought to spray their hops for lice and so many of them will have poor hops and some not any. Our yard that you saw is looking fine, and we give all the credit to our 'Friend' and Black Leaf 40."

Send for the Friend Catalog. Tell us what work you want a sprayer to do and let our expert help you by the most economical model for you to use. There's a Friend for every man who sprays at a price he can afford to pay. Get in touch with us today. Get the catalog. Give us enough information so we can advise you how to buy economically.

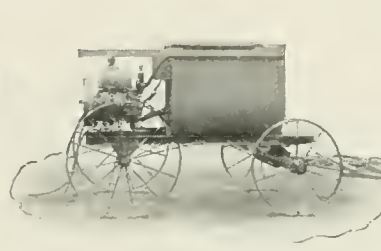
Friend Mfg. Co., 31 East Ave., Gasport, N. Y.



Friend King



Friend Queen



Friend Lightest King

Getting Together in Marketing or Reciprocal Marketing

Mr. H. M. Gilbert, before Horticultural Association Meeting, Spokane, Washington, November 17, 1915.

HOW can we get the marketing men of the Northwest to forget their differences and join hands to win success for our Northwest fruit industry. Mr. Shepard, in this month's issue of "Better Fruit," in an editorial entitled "Harmony Among Shipping Concerns," suggests what has been a big trouble, and noted the apparent change from bitterness to harmony in the following words: "During a few years previous to 1915 a great deal of bitterness existed between the different shipping organizations, resulting in a great deal of criticism, one association or shipping concern blaming the other for demoralizing competition. In their endeavor for tonnage, unnecessary campaign methods were used, which reflected, more or less, in many instances unnecessarily on other shipping concerns. It is with some satisfaction, therefore, that it is to be noted so far this year there is far greater harmony prevailing among shipping concerns than has existed for several years in the past. In fact, if there is any severe criticism on the part of one concern in reference to another so far it has not been made public."

I wish this apparent harmony and confidence among shippers were real and general, for we cannot solve the fruit-marketing problem of the Northwest until the marketing men have

more confidence in each other and are willing to play the game on the square. There is no hope until we forget our selfishness and recognize that the other fellow has the same rights we have. There is no hope until we are willing to join hands and pull together. It is expecting too much that under the lead of Mr. Paulhamus and the Growers' and Shippers' Councils we should, in one season, forget the bitterness and hatred that have been systematically preached for five years. All will admit with Mr. Shepard that if the bitter feeling has not been banished, it has at least been kept under restraint, and today we are at least able to meet and reason together. Some say the growers are to blame, that they are the ones who must solve the marketing problem. I admit the growers have a necessary part, but I believe it is up to the experienced marketing men to work out a feasible marketing plan and quit their fighting, get together and work together. I believe the growers will fall in line and help work out any comprehensive, practical working plan.

I note at a recent meeting in Seattle the plan was suggested by the Shippers' Council and approved by the Executive Committee of the Growers' Council, to tax the growers one cent per box for an advertising fund for market extension. I don't believe the shipping or-

ganizations and shippers have any right to ask the growers to tax themselves one cent per box until the shippers themselves quit their fighting, price cutting and underhanded methods. Many times more damage is done by our present unfair competition than could be offset by the hundred thousand dollars advertising fund as proposed. The shippers themselves must

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put their houses in order first. Let me illustrate. Early in the fall an old customer bought nine thousand dollars' worth of apples to be placed in cold storage at North Yakima. The purchaser engaged the cold storage and signed a contract therefor with the storage company. One of our biggest competitors ascertained the facts. Their representative went to our purchaser, offered him the same varieties and grades of apples at ten cents per box less and five cents per box less for storage, a saving of nearly a thousand dollars on the transaction. Of course, our purchaser canceled his order.

Here is another: Early in the season a considerable number of sales of Yakima prunes were made in Canada

at forty-five cents per box, or "suitcase." A competitor, desiring to break in and spoil the marketing plans that had been arranged, contracted the crop of a large Yakima grower on a thirty-cent advance and quoted these Italian prunes all over Canada at thirty-five cents a box. Of course, all forty-five-cent orders were canceled and the prune growers of Yakima lost ten cents a box. In that instance, unfair methods of one shipper cost the growers ten cents a box. Until the shippers correct such methods they can't well ask the growers to put up another cent per box for advertising.

Here is another: Wire from our salesman in Montana: "My sale to _____ will not stick. Dealers can-

celed, as they bought C grade delivered at dollar five from grower." A dollar five, less thirty-two and one-half cents freight, made seventy-two and one-half cents to the grower, not counting any expenses for his trip and expenses of sale. Our sale was at ninety-seven cents f.o.b. shipping point. All dealers here at that time were paying growers cash from eighty to ninety cents. I might mention a hundred instances during this season where grower-shippers, curbstone brokers and inexperienced salesmen cut prices and hurt the markets. The damage to the apple market was not serious, for owing to the short supply this season the weak factors could not get enough apples to do lasting injury. But what will be the situation when we have a full crop and need stable markets.

In his recent Seattle statement, Mr. Paulhamus says: "If all the apple business of the Northwest could be brought under one ownership or all the growers could be united into one selling agency, we would have no trouble in working out our problem of developing markets. Such complete control is impossible as long as we have many districts and thousands of growers with individual opinions and prejudices. Therefore, the solution of our problem is to have the men that we must depend upon to sell the crop work together, as nearly as possible, with the efficiency of one organization." Every practical man now admits with Mr. Paulhamus, that it is entirely impossible to get all the growers, or a large per cent of them, into one marketing organization. All practical men also admit that we have too many marketing organizations and too many other fellows cutting

What are your dairy problems?

To get started profitably in dairying as a side-line, the fruit grower needs helpful advice and suggestions.

Our service department will delight in doing this very thing, without any charge or obligation.

We are sole Oregon distributors for "Simplex" Separators, B-L-K Milkers, Papee Ensilage Cutters, Simplex Silos and all kinds of dairy, butter-making and cheese-making supplies.

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Portland, Oregon



prices; too much overhead charges; too many growers selling direct, cutting under the market; too many curbstone brokers showing the buyers how to get prices down; too many "independents" issuing frequent circulars, always quoting lower prices "subject to confirmation," not selling much but ruining the market, creating distrust, alarming the buyers and jobbers till they won't buy at all, and the consumer goes without the fruit, which falls to the ground and rots.

I don't see how the marketing men can look at the wonderful fruit of the Northwest going to waste while millions of people are wanting it and not be ashamed to keep on fighting each other. But what is the remedy? Is there any practical way? Mr. Paulhamus says, and I think he is right, that "the solution of our problem is to have the men that we must depend upon to sell the crop work together as nearly as possible with the efficiency of one organization." Is this possible, and how? In my opinion we must retain all the outlets we now have and utilize them efficiently. We must group and unite the work of the farmer-shipper who has an outlet among his friends in the East for a few cars, the broker who brings in buying orders for cash, the cash buyer with regular customers, the association or union or growers' agent or exchange, each with its extensive marketing machine and regular customers. We should keep all our brands and lose none of our loyalty for our various organizations. Do not the English and French and Italians and Russians fight together as earnestly as possible for a common cause, but each nation under its own flag? So the marketing concerns should unite. But we must change the sentiment—"My organization, right or wrong, it must succeed, no matter if the Northwest fruit industry is ruined." What need of fruit-marketing organizations after the fruit industry is ruined. Our sentiment should be, "My organization must be right, must play the game square, must be willing to give and take, must treat the other shipper as we would have him treat us."

There are four classes of growers, the grower who sells for cash, the grower who ships to distant markets on consignment, the grower who believes in and belongs to a co-operative organization, and the grower who employs the best selling agent he can find to sell his fruit for him. No matter what we may do we will always have these four classes. How can we harmonize these four classes and get them to work together. Let me illustrate. Under a reciprocal arrangement in each district the marketing organizations could employ one man to represent us all in the Philippine Islands. Such a man could create a new market for several hundred cars of apples. No one shipping concern has yet thought it could afford to do this. We could all unite and send a salesman to South America, with like results. When the war is over we should have at least one man in Rotter-



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Ask any owner who attended our 1915 Caterpillar School. He'll tell you how the school increased his profits, taught him to get maximum results from his tractor. And our annual Caterpillar School in Stockton, Calif., and Spokane, Wash.—free to owners—is just one branch of our complete service.

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Reg. U.S. Pat. Off.

Don't Say Caterpillar Unless You Mean Holt!

The best service we give is the service we build into the Caterpillar itself—the kind of service of which owners write: "Have used my Caterpillar five years. The original track chains are still in use."

"Repair bill for season less than \$10.00."

"\$10,000 worth of work this year—repair bill \$1.65."

A postal will bring you Bulletin BE 334 which describes the Caterpillar fully. Or if you're interested in the Caterpillar School, opening January 31st, write for particulars—a low tuition fee admits you if you're not a Caterpillar owner.

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"THE MAGIC LAND OF PALMS AND FLOWERS"

Southern California has much to offer you this winter. City or country, mountains or beach resorts all are inviting. The Panama-California Exposition at San Diego will remain open another year—bigger and better than ever. But Southern California offers something even greater than this. It is the ever-present and delightful

Sunshine and Flowers

Roses in bloom, Oranges and Lemons ripening on the trees, Poppies and Geraniums everywhere. This is the real California. The expense of a trip to Southern California is not great.

Low Round Trip six-month tickets are on sale daily from Pacific Northwest points. Stopovers are allowed at pleasure. Through car service on the limited trains, through dining car and observation cars make the all-rail route the delightful way to go.

Ask your local agent or write

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SOUTHERN PACIFIC

S.O.S. From the good ship "Long Bow."

"A periscope has just been observed to port—we are altering our course, hoping to zig-zag away from the enemy—send help quick."

The message suddenly stops. It is believed that the Long Bow has gone down with all hands. Prominent among the passengers was Mr. Bunco Skinner, whose spectacular success as promotor of the Continental Market Distributor's Bureau attracted wide attention. It is reported that Mr. Skinner was urged to devote his talents to **INTERNATIONAL PIRACY** and he is said to have been on his way to accept such a post with a prominent European belligerent when the Long Bow was submarined.

(C. C. P.)

Good Bye, B. S., Proud Produce Pirate!

Your B. S. schemes have served their purpose if their lessons have been learned by Better Fruit readers who have watched your trail.

Northwestern Apple Producers will never prosper till they quit being gulled by clever prestidigitators who profess to pluck dollars out of the thin air. The latest form of this emotional insanity is to be found in the **NATIONAL DISTRIBUTOR IDEA**. This idea insures a rake-off to everybody except the producer—he gets what is left.

There is no magic in mere size and volume. The formidable combinations of so-called National Distributors are everywhere breaking down, and the trade is settling back to the time tested and normal condition of **INDIVIDUAL** effort. The victims of the National Distributors are tired of holding the bag. The number of independent local shipping organizations is increasing. The F.O.B. sales are heavier, and we are beginning to hear of F.O.B. auction sales.

The producer's problem finds its true solution in a **UNION OF INDIVIDUAL EFFORT AND LOCAL CO-OPERATION**. Carry your eggs in one basket and then watch the basket. The small producer cannot watch a National Distributor, but he can watch and guard his interests in a local union of neighbors.

The Produce Reporter Company stands for the individual producer and for co-operation. The story of how to market your produce safely and get the maximum returns will be sent to anyone interested. It is free on request.

Produce Reporter Company
CHICAGO

dam, one in London, another in Hamburg, possibly another in Copenhagen and north—when we can ship direct through the Panama Canal.

But the great big work of getting new markets and multiplying our outlets is in the small cities and towns of our own country. It is easy in a year of moderate prices to put a carload or two of apples in a town or village that only gets a hundred or two boxes per year now. For ten years I have consistently worked on this plan, opening up these new small markets. This year, according to railroad records, the Yakima Valley shipped 1,000 cars of mixed fruit into these small markets. The sales organization I represent shipped 423 carloads, leaving less than 600 cars for the other one hundred and thirteen Yakima shippers. If only two or three other shippers had duplicated our work in this line the soft-fruit marketing problem would be solved. I agree with you this can be done only as we get together in each valley or district on joint-selling boards or by reciprocal arrangements with each other and with the other districts. If the main shippers in each valley will get together on a joint-selling board, send out one set of prices and one set of traveling salesmen, working together and not fighting each other, the marketing problem will be solved. I admit this will take a lot of patience, organizing ability and real up-to-date salesmanship. But tell me, why shouldn't we do it? Isn't our orchard industry worth the effort? Why should we have one hundred and fourteen sets of prices go out of the Yakima Valley? Why should the Northwest have fourteen apple salesmen in Bozeman at one time and not one salesman in fourteen hundred other towns? Why should we maintain eight salesmen in Butte when two could do the work better?

You ask what we accomplished this summer at Yakima, with the assistance of Mr. Paulhamus' committee, Mr. Davidson and the Growers' and Shippers' Councils. First, remember, all the machinery was new; most of it had to be made or remade without any money when the season was full on and the marketing machinery in motion. One big thing we accomplished by united effort was getting Uncle Sam to send out two young men from the Bureau of Markets. Daily meetings with these men, receiving telegraphic reports from Washington City, giving prices at all Eastern markets, distribution of our own shipment and our competitors', and getting this information at one p. m. each day were helps that can scarcely be overestimated. It was a great drawback that the farmer-shippers and some other busy shippers would not meet regularly, so did not get all the benefit.

Another big thing we found—that it is absolutely necessary to have the assistance of strong cash buyers, or have a considerable guarantee fund to draw on to protect the market at critical times, or perhaps both. Our situation was that three cash buyers were openly

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Tower's Fish Brand

Reflex Slicker
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sheds every drop. Easy fitting and strong at every point. *Reflex Edges* stop every drop from running in at the front.

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HIGH GRADE FRUIT BOXES
APPLE, PEAR AND PEACH BOXES
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GOOD SERVICE—Write us
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Protect Your Trees

DON'T take chances with your young trees. One rabbit will kill many in a single night. Mice and cut worms will damage and destroy them if you don't protect them. Get dollars' worth of protection at a fraction of a cent cost by using

Hawkeye Tree Protectors

Absolute protection against gnawers and borers. Prevent trees from becoming skinned and bruised by cultivator or lawn mower. Made of elm veneer, chemically treated. Easily put on and will last until tree is beyond needing protection. Don't wait until some of your trees are killed—order Hawkeye Protectors now. Regular size 10 inches wide, 20 inches high. Price in lots of 100—1 cent apiece, in lots of 1000—1/2 cent apiece. Special sizes made to order. Write for circular and samples.

We make Fruit Baskets—get our prices.

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and unitedly fighting the proposition. Another thing we ascertained; whether price agreements are unlawful or not, they are not feasible, and are undesirable. Not feasible because the scores of grower-shippers do not come in to make them, and those who did come to the meetings apparently came to ascertain the prices being quoted and then proceeded to quote at five or ten cents less. Some of the brokers attended the meetings, played the game square, but they didn't get any business, because no buying orders will be sent unless at a lower price than the principals can buy on regular terms. My own feeling is that there is a legitimate field for brokers as business getters, and that the discount they should have for getting the customer and getting the money would pay them well. But they should not issue general circulars at cut prices on regular shipping terms and depend on the growers to fill the order and hold the sack. The buyer in Philadelphia or anywhere else can well afford to pay a good live broker five to ten cents a box to buy, inspect and pay for a car of apples. The joint-shipping board can well afford to allow this five or ten cents for the sale, cash payment and inspection at this end. Let's not fight the broker, but get him to come in with us and be a benefit instead of a hindrance. With the correct recognition of the services the broker performs, I believe the legitimate fruit broker can be made a considerable benefit.

You ask how to handle the "grower-shipper." The grower-shipper who ships to his friends back East in markets which the regular shippers don't reach and gets ten cents per box more for his peaches is doing the fruit industry a distinct service. He is not a price cutter or a market destroyer. He is a genius, a benefactor to the industry. I wish the growers could all do this kind of marketing. But the growers who do this kind of marketing are few. It is the grower who loads his fruit, rolls it to the commission merchant on consignment, rolls it "wild" to Montana or Dakota, takes a train and offers his fruit to retailers at any old price—he is anything but a benefactor. When Mr. Davidson and the shippers got the f.o.b. price of peaches up to thirty cents at one time

last August, a big Zillah grower was back in the Bismarck and Fargo territory offering his Elbertas at twenty-five cents to retailers and wholesalers alike, and shed tears because he couldn't sell them. He couldn't sell them because he had ruined the market. At the same time Sioux City wholesalers bought four cars direct from growers, two at 20 cents and two at 20.4 cents, when all the regular dealers were trying to get and were getting 27½ and 30 cents.

In my opinion, the "grower-shipper" is a product of the marketing men's own folly. Because some organizations have for five years conducted a crusade and preached the doctrine of hate against the old shippers that had grown up with the business, and because some of the old shippers have answered in much the same colored fumes, the "grower-shipper" has been produced. Ground to powder, while, and because, the market men were fighting, getting less than cost of production for his products, the grower has been driven to despair. He has lost faith in the men and organizations who have sold his fruit. The "grower-shipper" is the natural product of our marketing follies and fighting. When we quit fighting, when we consult our common sense, when we marketing men get together in the different districts, the grower-shipper will no longer be a menace, because it will pay him better to market through efficient marketing agents. I think I have foreshadowed my idea of

the present remedy. Get together in the different fruit districts on joint-selling boards, or get together by reciprocal marketing arrangements, and then let the different districts reciprocate. In my opinion, this can be done under the general supervision of your growers' councils and leagues and units, which should have a closer organization. But the marketing plans, the reciprocal arrangements, must be worked out by the marketing men.

Continued in next issue

The winter short course of the Oregon Agricultural College will be held January 10 to February 4, 1916. These meetings are largely attended by farmers and fruit growers from different parts of the Northwest, because they have found them to be of much value in assisting them in their work. The course this year will consist of fruit raising, stock raising, dairy work, poultry, gardening, sewing, cooking, household arts, farm engineering, marketing, etc. Every fruit grower and farmer who can possibly arrange matters to take one of these courses will be well repaid for so doing.

"Mushroom Growing," by B. M. Duggar, is a new treatise on this subject, published by the Orange Judd Company, 315 Fourth Avenue, New York.

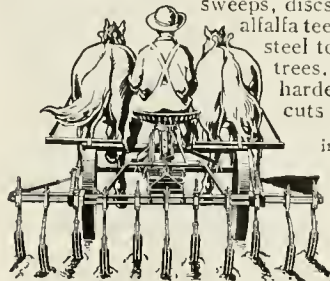
Mr. Ramie de Ruew of Simmons, Washington, has ordered 85 tons of Shady Brook Sheep Feed for use during the lambing season.

The Walla Walla Meat & Cold Storage Company has ordered 100 tons of Shady Brook Sheep Feed to be used for fattening.

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This No. 41 Planet Jr Orchard Cultivator produces biggest crops in orchard, vineyard or hopyard. The strong frame carries teeth, sweeps, discs, furrowers, irrigating steels, plows, alfalfa teeth, and special weeders. Low wheels, steel tongue, tree shield, side-hitch for low trees. Light draft. All steels specially hardened. Works deep or shallow, and cuts 4 to 6½ feet wide.



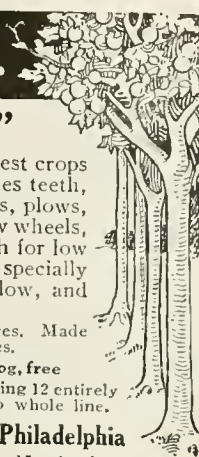
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How Spray Kills

Continued from page 18

eating it shall be indifferent to its presence. Doubtless it is true that combination sprays have often proved effective and that success has often followed the addition of lime to a poison spray, but in such cases success is relative, and better results would have probably been secured if the poison had been left tasteless.

The use of an alluring bait is directly opposite to that of the repellants. Traps and sprays have been prepared with molasses, syrup, glucose, sugar, salt, manure, milk, lemons, oranges, cider, vinegar, aromatic oils or beer added to entice the various insects. Here, again, one sort of bait will not answer for all kinds of insects. Even

closely related species vary in their choice of flavors.

Arsenicals have long been considered the best of stomach poisons. With these sprays the object is to coat the food plant and the insect must then unconsciously partake of the poison when feeding. If the dose swallowed is weak, the insect ceases feeding, is attacked with a diarrhoea and finally relaxes in death. If the dose is strong a sort of inflammation of the bowels immediately sets up and death follows in a few hours. An arsenic compound must be insoluble, since the presence of free, soluble arsenicals scorches the foliage. For this reason the extremely poisonous white arsenic cannot be used in spraying, but the insoluble arsenates of lead, or arsenites of lime, zinc or copper can be safely applied, at least

under the usual Washington conditions. The compounds of arsenic and lead, zinc or lime have varying degrees of stability. Basic arsenate of lead is extremely permanent; it can be used with safety in climates where other arsenicals scorch. But for the same reason it is slow to kill, for an arsenical must be digested and absorbed by the insect before it can cause destruction, and in the meanwhile the wormhole is becoming larger. Zinc arsenite is a quick-acting insecticide. It is easily absorbed in the insect's body and it is therefore valuable for the larger species which require a stronger dosage than weak, newly-hatched insects do. But this quickness of effect implies relative instability, and in fact zinc arsenite has caused serious scorching in damp weather. Arsenites of lime and of barium are coarse grained and have been ruled out as insecticides because their particles loom up too large to deceive the microscopic worm.

Arsenicals are dangerous poisons when taken in the proper amount. Very weak dosages act as a stimulant, to whet the appetite and add to one's endurance. It is well known that certain people eat arsenic in increasing amounts, beginning with the maximum safe dose of one-twelfth of a grain and

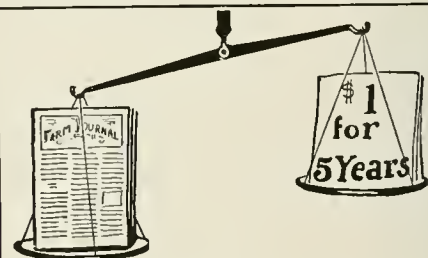
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The Farm Journal

263 Washington Square, Philadelphia

adding to this until they finally are able to take more than six grains at a time, or several times the amount that would normally produce death. If a tree is poorly sprayed, a leaf-eating insect might get here and there a particle of arsenic to act as a tonic, and a spraying might therefore conceivably do more harm than good. To test this hypothesis Professor C. T. Brues of Harvard University and I last year secured eggs of the Gypsy Moth from sprayed and from unsprayed woodlands. The caterpillars developing from these eggs were fed varying but weak dosages of arsenic and showed a measurable resistance to the poison in favor of the caterpillars reared from the sprayed trees. While this experiment shows that there is a hereditary difference in insects in their susceptibility to poison, its explanation is perhaps merely this: Where spraying is not thorough, so that not all insects are killed, the ones that escape are most apt to be the hardier, more resistant individuals, and such vigor is apt to be transmitted to coming generations.

Contact insecticides are, generally speaking, of two kinds—those that suffocate the insect by clogging or poisoning the breathing system, such as soaps, oils, tobacco or fumigants; and those like sulphur-lime or sulphur-soda, that produce a chemical reduction of the insect's body. Insects breathe not through a mouth or nose, but through a series of pores arranged along the sides of the body. These pores open into a system of tubes of microscopic fineness, which permeate every part of the body. Plugging of the pores by oils or soaps results in death. Here the spray must actually wet and adhere to the greasy body of the insect, which explains why nicotine in water solution is much less effective than when combined with soap.

Sulphur-lime is a very unstable solution. Principally it consists of a chemical called calcium polysulphide (CaS_4). As soon as exposed to the air this substance absorbs oxygen and is converted into a series of compounds known, in the order of their formation, as calcium thiosulphate (CaS_2O_3), calcium sulphite (CaSO_3), and calcium sulphate (CaSO_4). This reaction calls for a progressive absorption of oxygen and a simultaneous deposition of the finest of sulphur. The combined action of the withdrawal of oxygen from the insect sprayed and the effect of the deposited sulphur are supposed to account for the insecticidal action of sulphur-lime.

Sulphur-soda has proportionally much more of the thiosulphate compound, which in this case, as sodium thiosulphate, is the familiar "hypo" used by photographers, and has no insecticidal value, as it is not oxidized further. Theoretically, therefore, a sulphur-soda spray should be less efficient than sulphur-lime, instead of being much better as claimed by the manufacturers.

The decomposition reaction of sprayed sulphur-lime is rapid at first, but con-



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Will Spray as many Trees as Three Barrels of Lime Sulfur




"Scalecide" has greater invigorating effect on your orchard—kills more scale, eggs and larvae of insects with half the labor to apply. We can back up this statement with facts concerning the Good Results from Using

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Send for our illustrated booklet—"Proof of The Pudding". Tells how "Scalecide" will positively destroy San Jose and Cottony Maple Scale, Pear Psylla, Leaf Roller, etc., without injury to the trees. Write today for this FREE book and also our booklet—"Spraying Simplified". Learn the dollars and cents value of "Scalecide, The Tree Saver".

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The Alpha Automatic Power Spray Outfit

(PATENTED)

Fitted with 2-inch or 2½-inch Automatic Duplex or Triplex Pump.—Equipped with the New Mechanical

Automatic Pressure Governor

Which Insures Safety, Secures Uniform Pressure and Eliminates Unnecessary Wear.—No Relief or Diaphragm Valve Required.—Top Guard Rails Fold Up or Can Be Quickly Removed.—Gear or Belt Driven.—Brass Fitted Throughout.

THE TWO ESSENTIALS in a power sprayer are a thoroughly dependable engine of ample horsepower and a positive and reliable pressure regulator that will insure uniform pressure and eliminate unnecessary wear.

THE AVERAGE SPRAY RIG is equipped with a cheap engine and a makeshift pressure relief valve or diaphragm, which is exposed to the corrosive action of the spray material, which soon puts it out of commission.

THE ALPHA AUTOMATIC PRESSURE GOVERNOR with which the Alpha Spray Outfit is equipped is a simple arrangement of a combined lever and spring on each plunger connecting rod which, when the pressure reaches a pre-determined limit, automatically discontinues the operation of the pump without interrupting the driving power, again permitting it to resume operation when the pressure falls below the point at which it has been set.

THIS INSURES SAFETY, secures uniform pressure, and eliminates unnecessary wear (no liquid pumped except it passes through the nozzles), the pressure relief is not dependent on the operation of a sluggish or defective relief valve, but is positive and mechanical, thus making it impossible to run the pressure up to the danger point.

THE POWER PLANT, depending on the size rig, is either a 2½-h.p. or a 3½-h.p. Alpha Engine, equipped with a "built-in," gear-driven, positively-timed magneto, requiring no batteries or coil, and is easily started on the magneto without cranking.



CAN YOU AFFORD to own a spray outfit that will balk? When you get ready to spray you have no time to tinker with a defective engine, pump or relief valve, but want an outfit that is capable of a continued high pressure maintenance and one that is thoroughly dependable in every particular.

THE ALPHA AUTOMATIC SPRAY OUTFIT will meet your most exacting demands. The entire framework is made of channel and angle iron, fitted with a wrought steel bedplate on which the engine and pump are mounted, direct connected with machine-cut steel gears.

BUILT IN ALL SIZES from a 2-inch pump and a 100-gallon tank to a 2½x3-inch pump and a 200-gallon tank. (Either duplex or triplex.)

IT WILL PAY YOU to investigate thoroughly the merits of the Alpha Automatic Power Sprayer before buying. Send for catalog and prices.

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tinues for a month or more in a weaker and weaker degree. Not all scale insects succumb to the first shock following the application of spray, but many individuals maintain a tenacious hold on life that carries them past the danger period, and later these few individuals grow and reproduce. Sulphur-lime undoubtedly induces a selective mortality in the case of the San Jose scale and of the eggs of red spider and aphids. In these cases the actual strength of the solution appears to have little effect on the degree of resistance of the insects.

Farmers' Week at O. A. C.

The Farmers' and Home-makers' Week and Rural Life Conferences to be held during the week of January 3, just in advance of the regular short course, will give the fruit grower and farmer a splendid opportunity to hear lectures on valuable subjects of vital importance to them. There will also be brief, pointed, instructional lectures by leaders in our state and from other states on subjects of importance to home-makers, engineers and all industrial workers. There will be demonstrations in the laboratories, dairy, domestic science kitchens, stock barns, gardens, orchards, greenhouses and fields. There will be opportunities afforded for examining and testing the merits of many different types of farm machinery; opportunities for judging, according to accepted standards, the different breeds and types of livestock; conventions and conferences of some of the state's greatest industrial and professional associations.

The Oregon Agricultural College is going to make this week a profitable one for all those interested in the development of the state, community and of the individual. As the regular college will not be in session that week, the students' quarters will be available for visitors, thus assuring ample accommodations at moderate prices. The college faculty will devote their entire time to personal interviews and to the regular exercises of this week. The railroads will give reduced rates and

there will be no charges or fees for the lectures or conferences. For further information write R. D. Helzel, director Extension Service, Corvallis, Oregon.

Brewster, Washington, won the sweepstakes award for the world's best apples, which went to Mr. Fred Conklin. This exhibit was prepared by Henry E. Tweed, a student of the Washington Agricultural College, Pullman. Much credit has been given Mr. Tweed for the careful pains in preparing the exhibit. Considerable amusement is being obtained at the expense of Hood River, for the reason the exhibit of Hood River was seven points ahead in the scoring until the judges happened to discover a tiny worm in the Hood River exhibit, which lost the prize for the State of Oregon, giving the honor to Mr. Fred Conklin of Brewster, Washington.

Feijoa Sellowiana is the name of a new fruit that is being introduced by W. A. Lee, Covina, California. The fruit is about the size of a hen's egg and is said to be of very delicious flavor. The *Feijoa Sellowiana* is a native of Southern Brazil and Uruguay, having been introduced into the moderate climates of France and Southern California very successfully.

SHADY BROOK DAIRY FEED

What One User Says

"It speaks well for Shady Brook when three cows fed upon it make over 105 pounds butter in seven days and each breaks a world's record for age."

As a modern business dairyman we ask you to try our Shady Brook. It is proving to be the most economical and profitable dairy feed on the market. It is pure alfalfa and high grade cane molasses, 50% sugar.

Write for name of nearby dealer and booklet No. 70.

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A SCIENTIFIC work written in plain language and devoted to practical ends.

The only work of the kind now complete and up-to-date. A thorough manual of fruit and vegetable growing, covering every practical feature. Plant troubles, the fullest ever listed in one work with every remedy. Planting, pruning, spraying, harvesting, packing, marketing—all the methods so successfully practiced in the Northwest. Statistics of the fruit and vegetable business. All carefully indexed. Four volumes, 2,064 pages, 750 splendid halftones, drawings and colored plates. 200 contributors.

"Every grower should have it, for between its covers may be found the answer to practically every horticultural problem with which he will sooner or later be confronted."—E. K. CARNES, formerly Entomologist for the California State Commission of Horticulture, and now Superintendent Natomes Consolidated, Sacramento, California.

Write for circulars and prices to "Better Fruit," Hood River, Ore.

Advertising the Northwest Box Apple

By Orris Dorman, President Spokane Fruit Growers Company.

I MIGHT say first that no definite plan of operation was presented, and it was advised that the formulation of the plan be left to the board it was proposed to create to manage the undertaking after funds were provided. The principal argument presented by its advocates was that we should agree that something should be done; which we believe has been agreed on the part of the growers for some years. While there was no plan of operation presented, Mr. N. C. Richards, general counsel for the North Pacific Fruit Distributors, stated that the plan was to go into a market and create a demand for Northwestern box apples, letting all sell who wished to do so. That, to our minds, would greatly intensify the competition in such markets between those contributing the funds, to say nothing of the quantities of apples that would be attracted to it belonging to outside shippers. Manifestly the only beneficial results of such an undertaking to those financing it would be the benefits accruing to box apples generally by developing markets that took

care of additional tonnage, and we doubt that our growers would support such an undertaking for any length of time.

It is our belief that our growers have been asked so often to join different organizations looking toward the betterment of the marketing conditions for their fruit that a large percentage of them will refuse to give favorable consideration to this matter for the reason, if no other, that they have contributed liberally of their funds on many occasions and are now determined to wait until some organization makes good in its merchandising methods and sells to better advantage the fruit entrusted to it. In view of this fact, it occurs to us that the safe plan to follow at this time is for each district, or each shipping organization, to proceed on its own market-developing plans or to pick up and perfect the market-extension plan partially tested by Hood River and Spokane, until something definite is proposed that promises better results.

Experience has proven that the details of this plan of operation can be carried out by the salesman of average ability. It is not so exorbitantly expensive and the increased prices received appear to go a long way toward meeting the expense. It has a certain amount of prestige, which at this juncture seems necessary. The plan is one by which many other industries have developed markets and held them and increased them to take care of a constantly-growing product. Fully developed and undertaken on a scale large enough to move the bulk of the tonnage of some of our large districts, it should be attractive to the ambition of any of those who wish to succeed in a large way at this sort of thing. True, it does not present the dazzling allurements of the suggested plan of general advertising and market extension, with a fund running into six figures. It appeals to the grower, however, as he can be made to see where his money is being spent in the very simple and effective undertaking through specialty salesmen and advertising to intensively work certain fields in the sale of his varieties and his brands. The benefits accruing to box apples generally, of Colorado, California or even of the neighboring Northwestern States, is merely incidental. There is nothing new or spectacular about it. It is simply beginning at the beginning, or at the bottom, and working up with the means at our command, without attempting to create new means or new agencies, which might prove impossible and which quite likely when created would prove impractical.

If anything approaching reasonable division of territory in which each separate organization can work in the upbuilding of new markets, spending its own money in its own way, free from the competition of other like organizations, we believe that each can serve its growers more acceptably than a combination can serve all the factors composing it. In addition, it can spend as much money and effort as it pleases in markets that cannot be divided, that will always remain common fighting ground. In this way only can the competition between varieties and between brands, that we have always heretofore felt, be eliminated. In this way the jealousies and suspicions between districts can be eliminated that have heretofore, and always will, render ineffectual any combination on a large scale of conflicting interests and ideas.

The Famous Aetna Brand

of guaranteed absolutely pure Lime and Sulphur Solution. Manufactured by an Orchardist of over 25 years' practical orchard study. The spray that spells perfection. Recommended by leading growers to be the best on the market.

FOR PRICES, ETC., WRITE B. LEIS

B. LEIS, The Aetna Orchards

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Dependable Brand Lime Sulphur Solution

The Standard Solution for the Fruit Growers of the Northwest. Highest percentage of Sulphur in Solution in proportion to Baume test of any brand offered on the market.

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SPRAY

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No water—all poison—easy to ship and handle—no danger of freezing, drying out or spoiling—the latest improved scientific mixtures that give maximum killing power without injury to foliage:

**Arsenate of Lead
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refinery gasoline

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For almost ten years PICTORIAL REVIEW has stood supreme in the world of fashion. Besides there are general household helps and hints in every issue of the magazine—the sort of information which every practical housekeeper delights in.

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"Better Fruit" 1 year \$1.00 Both for \$1.65
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\$100,000 for Fiction

\$100,000 has been paid for fiction which will appear in PICTORIAL REVIEW this next year. Four great serial stories by world-famous authors. From four to eight short stories by the best short story writers in the world will also appear in each issue. Besides there will be fact and feature articles that will interest all.

This offer is for a very limited time only, therefore send your order soon and you save 85 cents on your subscription investment.

Address "BETTER FRUIT," Hood River, Oregon

Each district or each shipper, trying to outdo every other in their methods of merchandising fruit promises the simplest, least expensive and most effective plan for market development. It has in it elements of strength that would make for continuity of effort. Operations that can be financed year after year must get results that are easily pointed out to the grower. Our growers and business men could understand the plan of operation, know how and where and by whom their money was being spent, could accurately measure the results obtained and could fix the responsibility for success or failure upon men employed by them and answerable to them.

The new plan proposed does not even follow the idea always heretofore advanced that in some way the tonnage should be brought under control, and an effort made to orderly distribute it in the different markets, according to their size. While I believe that no effort will ever succeed in properly controlling and distributing the tonnage, it seems to me that through our plan is promised greater control of the tonnage than anything yet suggested. I can see no way of equitably distributing it, and marketing it orderly, until markets for all of it are found and methods followed that naturally direct the tonnage of the various districts to such markets. It seems illogical to me to try to prepare the markets generally for the tonnage generally of all our Northwestern growers. Some have proposed an all-Northwestern brand to be used in the general extension of our markets, and if such an arrangement could be effected and the fruit of this brand used without any apparent discrimination detrimental to any of our districts, or to the various varieties of fruit grown in the different districts, and the plan looked promising enough to insure its continuation from year to year, it might result in a great deal of good to the industry. However, it seems to me that it would be impossible to effect an arrangement of that kind that could continue permanently. I believe the effort would shortly degenerate to a point where we would have one more competing brand of fruit offered in the markets.

We are not expressing our opinion at this length because we believe that anyone is trying to take any advantage of any body of our growers. We concede that the advocates of this new theory of market development are just as sincere as we are in their efforts to promote better conditions generally. We have formed these ideas through our study and experience and submit them for what they are worth. We will insist that any plan submitted to the growers asking for the expenditure of their funds shall be carefully thought out and presented in a way that will give them an opportunity to consider its merit before voting upon it. This was specifically asked for in the resolution passed at the Growers' Council, and nothing with great indefiniteness about it will appeal to them.

ONCE IS ENOUGH ISN'T IT?

If the codling moth got 30% of your crop last year, how much will it get this year unless you

Use Crown Mass-o-Spray Nozzles

The only solid-cone-spray nozzles made.

Often imitated but never equalled

A GOOD NOZZLE IS KNOWN BY ITS FRUIT

MOST NOZZLES MAKE A BIG SHOW AND A LOT OF NOISE ABOUT IT BUT DO NOT HIT THE RIGHT SPOT

THE CROWN MASS-O-SPRAY HAS DOUBLE THE PENETRATIVE POWER OF OTHERS & HITS THE CENTER. READ THE LETTER AND THINK IT OVER



A NOZZLE WHICH WILL SPRAY AGAINST THE WIND IS WHAT YOU WANT. THIS ONE WILL DO IT. IT THROWS A SOLID CONE SHAPED MASS OF SPRAY. NOT A HOLLOW CONE AS OTHERS DO. IT COVERS IN HALF THE TIME. THE PRICE IS ONLY \$1.00 FOR TWO SENT BY MAIL AND GUARANTEED. CROWN SPECIALTY CO. 1629 WASHINGTON BLVD. CHICAGO, ILL.

WE MAKE THE MOST PERFECT SPRAYING ACCESSORIES ON THE MARKET—IT IS AN EXACT SCIENCE WITH US. INSIST ON HAVING THEM. A CROWN RELIEF VALVE ON YOUR SPRAY PUMP WILL SAVE A LOT OF TROUBLE. THERE IS NO JUST AS GOOD. PRICE \$4.25 BY PARCELS POST.

Dear Sirs: herewith hand you money order for One Dollar to pay for the two Mass-o-spray nozzles you sent me for trial some time ago. I want to say that you make no mistake in selling these goods on the plan you do for they surely talk for themselves. I bought a new sprayer of the largest capacity this spring, and I think these nozzles have increased its efficiency at least 25 per cent. They set a pace that is hard to follow. You will hear from me again as I need supplies. Thanking you, I am, Yours truly, Payette, Idaho, Apr. 27, '12. L. E. KEELE

For One Dollar we will mail you Two Nozzles

Send money order, Chicago draft, or currency. If personal check is sent, add 10 cents for exchange.

Also! Most high grade outfits are now equipped with the

Crown Relief Valve

If your outfit hasn't one, send \$4.00 for one prepaid.

Crown Specialty Co.
1629 Washington Blvd.
CHICAGO

Codling Moth Control in the Northwest

By S. W. Foster, Entomologist and Manager Insecticide Department General Chemical Company, San Francisco, California.

SO much has been written about codling moth during the last decade and so many speeches made on this subject one would seem justified in concluding control methods should be so well-known and so thoroughly practiced that further discussion of the subject was unnecessary. This year's experience, however, would indicate that the codling-moth family is a very large and exceedingly live one, and a foe well worth our best

efforts to combat. Many fruitgrowers of the Northwest have been sorely disappointed this year. It has not been pleasant to see such a high percentage of apples go to the cull pile, especially when the crop was short and prices, for marketable fruit, better than any time for three years past. This disappointment is by no means confined to the fruitgrower, but affects every person who has the welfare of this country at heart and either directly or indirectly affects every industry of this large section. Manufacturers of any commodity, whether it be spray materials, farm machinery, shoes, automobiles or what not, want the fruitgrower and farmer to obtain adequate returns for his produce. These returns judiciously applied toward producing more and better fruit and other farm crops mean greater prosperity to every section. If this loss results in more careful work in the future, and better practice in every detail of control operations, this year's experience will be of value, for it is seldom that the wise and successful man makes the same mistake twice.

Many people are studying the apple problem from different angles. You have marketing experts, efficient salesmen, good graders, many of you know your soil and climate and are adept in cultivation and pruning; then why such woeful failure in some cases to properly control the worms? An extensive trip throughout the apple sections of the Pacific Northwest this fall convinced me that the one main cause above everything else was the failure, by the fruitgrower, from whatever may have been the cause; to properly meet conditions as these conditions actually existed in each locality. Every orchard I saw that showed a high percentage of wormy fruit showed very little, if any, arsenate of lead on the fruit or foliage in late August to early September. It seems to be human nature among all of us that after considerable experience with some special line, if we meet with any degree of success, we begin to think

that question solved for all time to come, and therefore begin to neglect the more important, necessary operations.

All forms of insect life are fighting continually for existence and the perpetuation of the species. Abundance of suitable food, favorable surroundings and climatic conditions, the absence of natural enemies and scarcity of or laxness in artificial methods of control all tend to allow a great increase in the numbers of any pest.

Hood River Pruning & Grafting Wax

READY FOR USE

Without Heating

1-lb. Can, postpaid, 60c

Made by

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Walnuts Are Dollars

Plant a Walnut Grove that will grow into dollars while you sleep. The Vrooman Franquette bears at three years and sells for 25 cents per pound—is smaller than an apple and sells for more money. Get in with the tide and get rich. At forty feet apart it only takes 28 trees to the acre. Is cheaper than an apple orchard to plant and makes your land more valuable.

True Vrooman Franquette
Walnuts Trees at Bargain Prices
at

Mira-Monte Nursery
SAN JOSE, CAL.

Wanted Position as manager of Orchard or Farming Proposition. Have had experience in Apple, Cherry, Prune and small fruit growing in both irrigated and non-irrigated sections. Experienced in general farming and understand prune drying. Graduate of Oregon Agricultural College. Can give satisfactory recommendations upon request. Address R. E. S., care "Better Fruit," Hood River, Or.

The Spray That Sticks

ADHESO

REG. U.S. PAT. OFF.

Insecticide—Tonic—Fungicide

WHEN other spray materials fail to do their work, because rain washes them off, "ADHESO" STICKS, killing the Codling Moth and PREVENTING the SCAB, because it stays where it is needed and does not wash off into the ground.

"ADHESO" GAVE 99 CLEAN FRUIT THIS YEAR, the worst in fifteen years for Codling Moth and Scab.

Write for details and means for making the STANDARD TEST FOR ADHESION.

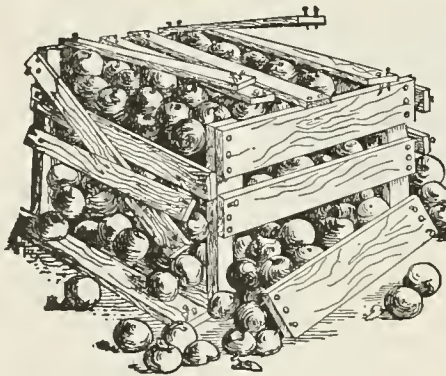
"Triangle" Brand Arsenate of Lead

The reason our Arsenate of Lead costs more than others, was shown this year. Ask any grower who used it. He DID NOT LOSE 50 to 75 by WORKY APPLES.

It is not the COST PER POUND but the COST PER SPRAY TANK and RESULTS OBTAINED that count.

Ansbacher Insecticide Co., Inc.
TRIANGLE BRAND

527 Fifth Ave., NEW YORK CITY



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

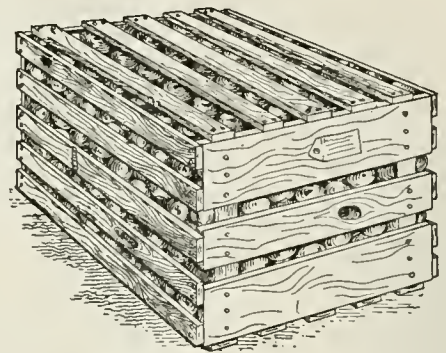
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles

AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

In some sections last year (1914) the apple crop was heavy, prices low and far less than the usual care given the orchards, especially insect-control measures. Apples were not picked as closely as usual, some were left on the trees, more on the ground, wormy apples were thrown away with little thought of loss. The season was more open, fair and reasonably warm till late fall, many worms hatching from eggs deposited even as late as harvest time found sufficient food for maturity, all of which resulted in a heavy carry-

over of worms and a more general infestation of fruit this past spring than had occurred for some time previous. Weather conditions then interfered with the routine spray operation, in some cases the application was greatly delayed or omitted and sometimes heavy rains followed soon after the spray was applied. Only very few growers took the precaution to repeat the application under these conditions. Those who did so have been repaid many times over. Also there was no regularity in broods of worms. In

fact there was little distinction or division between the broods this past summer; worms hatched almost every day from the beginning of the first brood until the end of the last and entered the fruit unless killed. Fewer worms entered the fruit through the calyx and more through the side than is apparently the case during normal years. It was therefore important that the fruit and foliage be covered with poison all the time. Fruitgrowers should fully appreciate by this time the value of the first or calyx spray, for we know that most of the first-brood worms and a considerable percentage of the later broods enter through the calyx.

It is very natural for the grower to attribute the failure or lack of success to the material used and often to claim it was faulty. He is often encouraged from one source or another to do this. Those people, however, should remember that manufacturers of insecticides for interstate shipment must make them so they will meet the requirements of the federal insecticide and fungicide law. This law governs the standard so far as the contents or analysis of the spray material is concerned. Also some states are now undertaking to make all local manufacturers meet these same or similar requirements.



Earn Big Pay as a Tree Expert

From a farm hand at \$25 a month to a tree expert at \$3,000 a year—from monotonous grind to a fascinating, healthful, respected profession—that is the rise of the man pictured here, P. E. Hudson, Jamaica, L.I., N.Y. Through the Davey course of training by mail hundreds of young men, like Hudson, have improved their condition in life. *You have an equal chance.* A few months study, at home, in your spare time, will fit you for any of the following positions—Tree Surgery, City Forestry, Park Superin-

tendent, Fruit Growing, Tree Surgery and Fruit Growing, City Tree Expert, Forestry. These fields are uncrowded; you will have more demands for your services than you can fill. Write today for book, "Adventures in Success," and tell us which of the professions listed above especially appeals to you.

The Davey Institute of Tree Surgery, 435 Oak St., Kent, O.

Prune and Grafted Walnut Trees

Also Apples, Pears, Peaches, Plums, Apricots, Cherries, Small Fruit Plants, Etc.

Can be bought now at Greatly Reduced Prices

Write today submitting your want list for quotations.

LAFAYETTE NURSERY CO., LAFAYETTE, OREGON

Pear Trees for Sale

I have a large lot to offer of the following sorts: Bartlett, Anjou, Bosc, Winter Nelis, B. Clairgeau, Howell, Comice and other varieties. All budded trees, one and two years old.

I also have Plum and Prune Trees budded on plum, and budded berry-bearing and seedling Holly Trees from 2 to 5 feet. Also Mazzard Cherry and Marianna Plum stocks for nursery planting.

Good stock at very low prices to Nurserymen, Dealers and Planters.

JAMES W. STEPHENS
Kelso, Washington

FRUIT GROWERS Dehydrate Your By-Products

It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the best By-Product machine ever devised. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

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LUTHER MANUFACTURING CO.
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PORTLAND WHOLESALE NURSERY COMPANY

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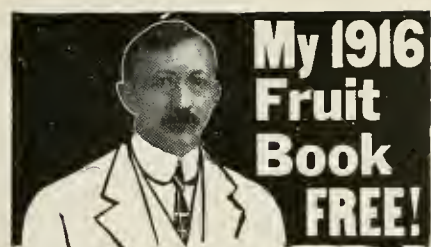
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A very complete line of
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Clean Coast Grown Seedlings

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Write Now Perfection Currants Write Now



**My 1916
Fruit
Book
FREE!**

**160 Pages, Illustrated
Write for it Today!**

Tells best varieties, season of ripening, growing habits, most satisfactory kinds for your section, which are best money-makers—choicest apple, pear, peach, plum, cherry, grape, bush-fruits, strawberries, roses, ornamentals, etc. Over 200 photographs. Book is worth \$1.00, but SENT FREE by return mail if you write today.

**\$1.420 From 1 Acre
of J.H. Hale Peaches**
Read all about this wonderful peach—how it sold at \$2.50 per bush this year when Elbertas brought 90c to \$1.25. Immense size, beautiful color, quality flavor, firm enough to ship in bbls.; fine for canning; ripens ahead of Elbertas—greatest money-maker in peaches. Also about Early Rose peach, offered to fruit-growers by us first time this season. **Highest quality and best shipping early peach.**

Delicious — The National Desert Apple
A flavor unsurpassed—success everywhere—New York, Ohio, Massachusetts, to Pacific Coast. Brings growers on the average \$1.00 more per box than other apples. Plant at least half your orchard to Delicious—get genuine Wm. P. Stark trees. Other good apples in catalog.

Hardy, Big Rooted Trees
Our Ozark Mountain, Stark City soil produces unusually heavy, strong, wide-spreading roots. These roots give the trees a quicker start, healthy, thrifty growth and bring them into bearing a year and sometimes two years sooner than ordinary-rooted trees.

No Agents! Save 30% to 50%
Our catalog is our only salesman. You save all agents' commissions and expenses. Get your trees direct from nursery—no rehandling. Our "3,000 Mile Package" ensures safe arrival anywhere. Every tree or plant doubly guaranteed true to name. We have customers in every state—some in your neighborhood. Get ready for early planting—write for the book today.

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Please send me Free 160 Page Fruit and Tree Book.

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Latest methods of beekeeping simply told in our "Bee Primer." Highly instructive. Send 25 cents today for the book and six months trial subscription to

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GOOD AS CAN BE GROWN
Prices Below All Others
I will give a lot of new sorts free with every order I fill. Buy and test. Return if not O.K.—money refunded.
Big Catalog FREE
Over 700 illustrations of vegetables and flowers. Send yours and your neighbors' addresses.
R. H. SHUMWAY, Rockford, Ill.

The real reason for lack of proper results can usually be found in the failure to properly meet the local conditions. The increasing amount of fruit grown in any section; the older, the taller, the larger and thicker the trees become the more worms and other pests will appear, unless extra efforts and precautions are intelligently applied to offset this natural increase. It is by no means as easy to fill every calyx cup or cover every apple with spray on a large, thick tree as it is to effectively do so on a small, easily accessible tree. Furthermore, the worms find more and better hiding places on the larger old trees, and a greater percentage of worms find protection during the pupation or transformation period. Too many growers were inclined to consider the codling-moth problem solved and did not give it sufficient attention.

My purpose in calling attention to these possible omissions is to point out the necessity of more and better care and more thorough work to meet any changed condition that may arise. Make more applications if necessary, but in any case protect your investment to give the greatest possible return. If an unexpected rain destroys the value of an application of spray repeat the spraying at once, and if long-continued rain or other conditions arise to favor the pests and to work against the crop, do an extra amount of work along the proper line to overcome this. Some are inclined to balk at the expense of the operation, but when we know that an orchard can be sprayed six times a year, once in the dormant state and five times during the growing season, allowing a combination of fungicide and insecticide for at least three sprayings at a total cost for the entire operation of five cents per box when you have 400 boxes per acre, of ten cents per box when you have only 200 boxes per acre, we cannot give nearly the sympathy to the man who yells expense as we do give admiration and encouragement to the man who says he has invested five cents per box or ten cents per box, as the case may be, to insure all of his fruit to be clean, marketable and is a credit to himself and to his community.

There is no economic reason why the Northwest, if properly handled, should not get an average of \$1.00 per box for most varieties of apples f.o.b. shipping station. By omitting one spray during the season, with a crop of 400 boxes per acre you may save one and one-half cents per box, or \$6.00 per acre, and lose 10 per cent of your crop, or \$40.00 per acre on your investment. Add to this your extra grading and packing expenses and you will have even a greater difference, which shows all the more proof that the greatest of care should be intelligently exercised to protect your investment against such loss and not consider money so paid as a tax, but as premium paid to protect the capital invested. In the last analysis that is the only way to consider any money put

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E.SHELLEY MORGAN MGR.

For the Next Thirty Days
we will deliver to you anywhere in U.S.
One Dozen Choice, Assorted Rose Bushes
For \$1.00
PORTLAND ROSE NURSERY
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Donald Nursery Company
DONALD, OREGON
Growers of a general line of nursery stock. A good clean stock of Italian Prunes and 2-year Bartlett Pears at special prices. Also a good line of Evergreens and Ornamental Trees and Shrubs.
Write for our Illustrated Descriptive Catalogue; mailed free on request.
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RHUBARB
Now is the Best Time to Plant
WAGNER'S IMPROVED WINTER RHUBARB
If planted NOW you should derive good results. Also BERRIES and small fruit.
Write for prices. J. B. WAGNER, Rhubarb, Berry and Cactus Specialist, Pasadena, Cal.

Walnuts—Grafted Walnuts
**Mayette
Franquette
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Best Three tried out and found practically blight-proof. All of best and largest strain. Bear after first year.
Big money in Walnut growing.
Write quick for our LOW PRICES.
TABLE GROVE NURSERIES
Healdsburg, California

True-to-Name Nursery
GALLIGAN BROS.
Proprietors
HOOD RIVER, OREGON DUFUR, OREGON
Growers of high grade nursery stock, guaranteed true-to-name. Breeders and importers of purebred Big Type Poland-China Hogs. Service boars, bred gilts and weaning pigs for sale.
For catalog of nursery stock and prices on swine, write
True-to-Name Nursery
HOOD RIVER, OREGON

YOU CAN EARN \$50.00 PER DAY
with the
Gearless Improved Standard
Well Drilling Machine
Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 8 hours. Another record where 70 feet was drilled on 2 1/2 gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. (Catalogue W.S.)
REIERSON MACHINERY CO., Mfgs., 1295-97 Hood St., Portland, Ore.

Mulconroy Flexible Metallic Spray Hose

LIGHT
Weighs 6 oz. to foot.
STRONG
Tested to 2,000 lbs.
FLEXIBLE
Will coil in 3 in. circle.

**Can't Kink, Twist,
Burst, Collapse
or Chafe**

Protected against kinking, hard knocks, sharp turns, dragging over rough surfaces and other outside abuse. Tube especially compounded to resist the action of the oily and corrosive liquids and powders used in spraying.

Full capacity always, because **HOSE CANNOT KINK.**

When equipped with Mulconroy High Pressure Couplings, it makes **THE STRONG-EST HOSE MADE.** Ask for No. 47 Folder.

J. W. GOEBEL, Factory Representative, Route No. 3, Salem, Oregon

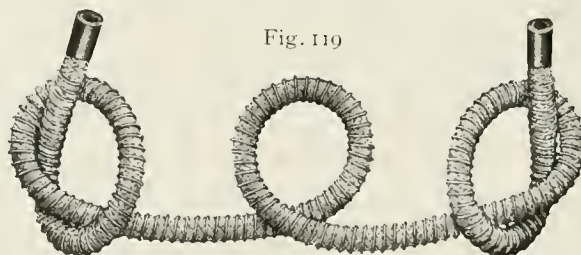


Fig. 119

Ridley, Houlding & Co.

COVENT GARDEN, LONDON

Points to remember when consigning
apples to the London Market

1.—We Specialize in Apples

**2.—All Consignments Receive our
Personal Attention**

**3.—The Fruit is Sold by
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Plantation four miles southwest of station, Belmont Road

We will be pleased to show you trees, apple trees that have a heritage, a quality that should be considered by everyone who plants a tree. Our trees are grown in clean hillside virgin red shot soil with clay subsoil, producing the most vigorous root system. Our buds are selected from the best bearing healthy Hood River trees that make the Hood River apple famous throughout the world. Our trees will give you satisfactory results in vigor, fruit and quality. Ask for catalog. We guarantee our products. Apples, pears, peaches, apricots, almonds and walnuts. A complete line of the best varieties of all kinds of fruits.

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Most Desirably Located. In the Center of Shopping and Theatre District
Covers a City Block.

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GEO. C. OBER, Manager

into an orchard venture. Look upon it as an investment or else to protect the investment you already have. We must look farther ahead and give full consideration to what the results will be at harvest, or selling time; that is, what returns the investment will yield, rather than take into account only the cost of the material you use and the labor to apply it. It is rare that the omission of one or two applications of spray, in order to save a small expense early in the year, does not result in a far greater loss at the end of the season. It would be folly to spend \$15.00 per acre on orchard spraying to give 85 per cent clean fruit and stop there when \$5.00 per acre added to this would give you 98 per cent clean fruit.

There has been much complaint this year as to the enormous number of side worms. Many growers report very few apples lost from calyx worms, but in some cases one-third of the crop was rendered unmarketable by injury from side worms. No single explanation could cover all the conditions in all sections which might tend to produce this state of affairs. It is generally conceded that in any section where conditions will permit three broods of worms per year that each worm maturing from the first brood will mean, in the absence of control measures, at least 600 worms before the season is over. Also most of the apples injured by calyx worms early in the season will fall from the trees before maturing. Furthermore, if the calyx cup is well filled with arsenate of lead it will usually remain effective throughout the season, killing all worms that attempt to enter the fruit at this place. It is rare that side worms are found early in the season, largely because so few worms are present at that time as compared with the enormous increase later in the year. While under normal conditions 80 to 85 per cent of the first-brood worms may enter through the calyx cup only some 10 to 20 per cent of the later broods of worms on unsprayed trees enter the fruit at that point, while the other 80 to 90 per cent go through the side. The principal reason, therefore, during normal seasons, for the great number of side worms late in the season is very largely because of the number of worms present to infest the fruit. In 1915 it seems evident that fewer of the first-brood worms entered the fruit through the calyx and more through the side than is normally the case. Due to cold, wet weather the first brood (the worms hatching from eggs deposited by moths emerging from over-wintering larvae) was delayed and strung out over a longer period of time; the apples were larger and smoother by the time the later appearing first-brood worms had emerged, and these worms found easy access through the side of the apples. The remedy is more careful and more persistent, thorough spraying, kept up continually through good years and bad, to keep the number of worms sufficiently reduced to prevent the appearance in great numbers at any time.

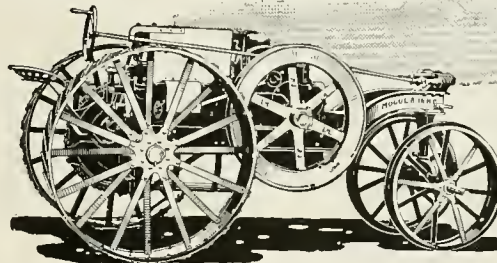
Do not get a mistaken idea of economy by saving material early in the season at so heavy a cost at harvest time. Use enough poison, properly mixed and thoroughly applied to every part of the trees at the right time to catch all worms, both early and late appearing, remembering that the codling-moth eggs are deposited both on the fruit and foliage; therefore at each application thoroughly cover with a thin film of spray every leaf and every apple on the tree. Watch the trees and fruit more closely early in the season, and if any worms or wormy apples can be found, or if weather conditions are such as to favor the development of worms or cause irregularity of broods and at the same time work against the effectiveness of or interfere with the timing of the spray application, make an extra effort and do extra work to meet the unusual conditions that may arise at any time or in any locality and which do arise at some time in every section.

Standard arsenate of lead paste will positively control the codling moth on any variety of apples in any section, if properly applied, to meet the actual conditions that exist. Work that is successful one year may not necessarily be so next year if followed out in the same way, but under different conditions. We cannot lay the fault for lack of success to arsenate of lead, for it is the best-suited poison, all things considered, that can be safely used on apple trees to control codling moth. Normally three thorough applications, properly timed, are sufficient to control codling moth, but it may happen that because of peculiar conditions four or even five applications will be a better investment than three.

Final Suggestions.—Spray the trees before the calyx cups close and fill every calyx with poison. This calyx spray may require two applications on some varieties of trees, but in any case it must be thoroughly done; a drenching is really necessary and the nozzles should be held in such position that the spray will be directed straight into the open end of the calyx. Subsequent applications are for the purpose of covering the surface of the fruit and the foliage also; for many eggs are deposited on the leaves and many of the worms hatching from these eggs can be killed before they get to the fruit. When you have a light crop do not make the mistake of merely picking out the fruit and spraying the few apples that may be there, but if you do any spraying during such years cover the foliage as well as the fruit. Do not make these summer applications too tight, neither should they be drenching sprays, but every apple should be completely covered. For these applications use only nozzles that will make a fine mist and have sufficient pressure for good work. Spray the fruit and foliage on the inside of the tree first, holding the nozzle near the center of the tree, directing the spray outward in such way as to cover that side of the fruit toward the center

Mogul 8-16 The Tractor to Buy

Mogul 8-16
Kerosene
Tractor



\$675
Cash,
f. o. b.
Chicago

WON
HIGHEST
AWARD
PANAMA-PACIFIC
INTERNATIONAL
EXPOSITION
SAN FRANCISCO
1915
REGISTERED U. S. PATENT OFFICE



AT the price, the Mogul 8-16 tractor deserves the careful attention of all progressive farmers.

It won a Grand Prize at both San Francisco and San Diego Expositions. That proves its class.

It can be used with profit on small farms, doing all the hardest work of the horses, and much that horses cannot do. That proves its usefulness.

It betters the plowing and other work of seed bed preparation, while reducing its cost, and—

It burns kerosene under all conditions. This one reason is enough to sell a Mogul 8-16, because, on the average, gasoline costs about 65 per cent more than kerosene. That proves its economy.

It costs about half its equivalent in horse flesh.

The price is \$675 cash, f. o. b. Chicago.

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of the tree, then finish by spraying from the outside of the tree and go all the way around the tree. Do not attempt to spray large trees from only two sides, but make a complete circle and exercise special care wherever an apple touches another apple or a leaf or limb. When worms are plentiful or indications are they likely will be so, spray the trees often enough to keep the surface of the fruit covered with poison to within a few weeks of harvest time. In all spraying for codling-moth control, use arsenate of lead paste containing 15 per cent arsenic oxide at the rate of 4 pounds or its equivalent, if powder is used, to each 100 gallons of spray.

Future of the Fruit Industry of the Northwest

By W. S. Thornber, Director of Extension Department, Washington State College.

IT seems like a great deal of presumption on my part today to undertake to talk to a group of fruitmen like yourselves upon the future of our industry after listening, as we have, to the many fine addresses by practical men as well as college men upon the life cycles of bugs and bees and rust and disease, but nevertheless I feel that at just this time it is wise to stop and consider rather carefully just what the future is going to mean for many of us fruit producers, lest we now make a more serious mistake in pulling up our apple orchards than we made eight or ten years ago in the planting of them. It is a remarkable fact, nevertheless it is emphatically true, that almost everything works in cycles or waves. During a certain period farmers everywhere run almost exclusively to stock, while during another it is grain and so on; first one fad and then another until we go bankrupt buying machinery or equipment to fit the numerous changes that project themselves upon us.

The Present Condition.—For the sake of better understanding our problem let us critically analyze our real conditions as fruitgrowers, and I wonder if the conditions of one of our most successful valleys would not represent the universal conditions of fruitdom in the Northwest? If so, here they are: Seventy-five per cent of the growers are dissatisfied because they have made no money during the last three years. But what class of people has made anything beyond a good living during the past four or even five years. Ninety-five per cent of the growers would gladly sell their holdings now for considerably less than they paid for them and willingly lose their time and interest in the bargain. Again, this is not remarkable when we come to realize that it is an almost universal rule to many people that something else always looks better than what they are doing. Hence the desire to change. Sixty-five per cent of the orchard area of the valley during the past two years has been so seriously neglected that it is a question in my mind now whether or not it

can ever be brought back to profitable fruit production again. If this, then, is the condition of one of the best valleys of the Northwest, what must we expect of some of the less favorable areas?

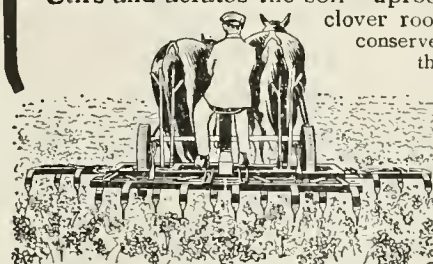
Let us stop for just a moment and learn the conditions of one of the less favored fruit areas of the West. I believe I betray no one's confidence when I say that less than a week ago one of the largest orchard operators on non-irrigated land said to me: "The last three years has conclusively taught us that it is folly for us to continue to endeavor to compete with the favored districts of the West. It is a losing game, for when we do produce fruit less than six per cent of it will pass as extra fancy, as compared with from fifty to as high even as seventy per cent in the favored areas, and while our land is cheaper our returns are so much lower that our losses are even greater." This party has already pulled 300 acres and will pull another 160 acres this year. Converting, as he is, all of his orchards into wheat and alfalfa land. I am of the opinion that when a new census of the orchard areas of the Pacific Northwest shall be made that instead of it representing a half-million acres that less than a quarter of a million will more than cover it, and even this will be materially reduced if owners do not use reasonably sane judgment in their haste to get from one crop to another.

The Causes for These Conditions.—A person needs only to visit one of the overdeveloped districts of the West to learn fairly accurately why thousands of acres of land was planted to orchards that should never have been planted. The story is a repetition of the "Razor Seller's Story." They were never expected to bear fruit. No one ever intended that they should, nor was there ever any provisions made for the fruit should there ever be any. The problem resolves itself into overzealous real estate boosting without sufficient knowledge or honest judgment of what constitutes good orchard lands and climates. Very briefly, we may easily sum up the factors that brought the fruit industry of the West to the conditions that now prevail, and in doing so we likewise portray the conditions of the East, that materially assisted in doing for the East what we have done in the West: (1) Unreasonable boosting of orchard and orchard lands. (2) Misrepresentation of the possible returns of orchard lands. (3) The keen American desire to make a change. (4) The inborn desire to speculate. (5) The cutting up of orchard properties into such small units that it is almost impossible for the average family to make a living upon the given area.

Were I considering the most serious factor entering into the problem as it now stands, I would certainly name the size of unit as the factor because of the intense hardships it is bringing to many because they cannot sufficiently diversify to make orcharding successful. If ten acres had been used as the

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smallest possible unit and even twenty and forty acres been planted, half to fruit and the balance to alfalfa or other crops, the conditions of the fruitgrowers of the West today would be far different to what they are now. This would have given them an opportunity to diversify and at least make a comfortable, independent living from their tracts. Closely associated with this factor has been the lack of knowledge that would have given the grower an advantage in doing something practical, something that would have brought in a money return rather than an experience without money value.

We hear from many sources of the losses of hard-working people who invested their small savings in Western orchards, and all true Westerners honestly deplore this, but we rarely hear of the losses of Eastern people who invested their savings in mining properties, and yet from one of the largest financial centers of the Middle West ten dollars went out for poor mining stock for every dollar that went out for Western orchards. We hear no complaint from these losers because nobody sympathizes with a person who loses in mining stock. Just why there should be a difference I do not know, unless one is looked upon as a form of gambling and the other is not. And, of course, a gambler naturally expects to lose a part of the time at any rate.

Fruit Growing Compared With Other Agricultural Industries.—Ever since man became engaged in agricultural pursuits there have been fluctuations from year to year in the prices of the various commodities, and so long as natural conditions make it impossible for the farmer folk to produce uniformly the same quantity each year these fluctuations will continue to occur. Anyone familiar at all with the prices of farm commodities cannot help but see this same condition in hogs, cattle, horses, corn, wheat and barley this year, and the producers of these crops have lost as much this year as the apple producers lost last year; and yet we hear very little complaint from them. They take their losses philosophically and know that they cannot win every year, but that their day is surely coming again. Just recently I saw a combination fruitgrower and hog producer sell his extra fancy McIntosh Reds at \$2.00 per box net to him at his orchard gate, and his extra fancy Duroc Reds at \$4.25 per hundred, delivered at the stock yards eight miles from his orchard. Now, if you growers know anything about hogs at all you know that he did not make anything on his Duroc Reds if he had to feed them any grain at all, and I can assure you he did. My purpose in making these few comparisons is a concrete one. I simply desire to show you that all lines of agriculture have advantages as well as disadvantages, and the men who are sure to lose the most are the ones who are so burdened with debt or are financially unable to take the strain of small profits or even losses for any period of time.

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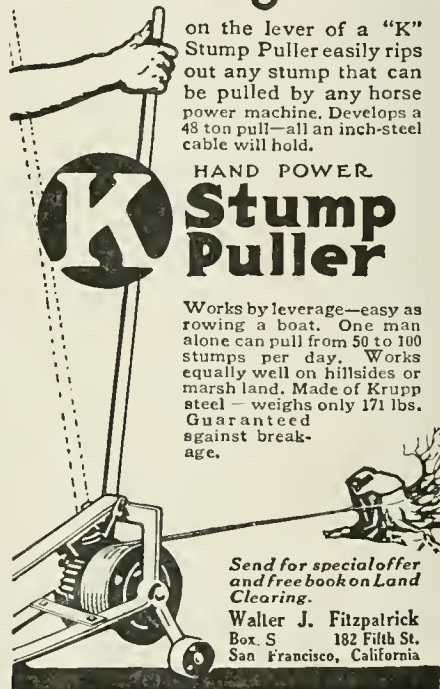
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Fruit growing is so closely allied to the other lines of agriculture that the same general principles of success and failure prevail, and probably the most important one of these principles or factors is the consideration of the profits of the industry for a period of years. There is no known agricultural industry of any kind that permits its operators to make a fortune in a year, or for that matter every year. However, any one of the numerous lines carefully and religiously followed up for a period of ten years shows net profits and good returns, and I believe that this is all we can expect of the fruit industry. Do not misunderstand me, for there are thousands of acres of land planted to fruit that can never under any circumstances pay interest on the investment, taxes, etc., and at the same time give a return to the owner. Such lands were never intended for fruit purposes and the sooner the owner or operator realizes this and removes the trees the better financially will it be for the owners. Nor is the land at fault alone in all cases, for there are other factors that must be taken into consideration, and these are some of them: (1) Proper profitable varieties adapted to the local conditions. (2) A system of planting followed out in such a manner as to make fruit production under those conditions profitable. (3) An orchard management that shall get the best from the trees annually. I refer here especially to pruning and irrigation, and personally believe that more is lost annually through lack of this knowledge than because of any other single factor in fruit production.

A factor that many people seemed to have lost sight of is that the great European struggle now in progress has practically destroyed the best orchards of Europe. Thousands of acres of orchards and vineyards are completely obliterated, and after the struggle has ceased it will require twenty years to replace these lands and make them as productive of fruit as they were before the war. As a fruitgrower, I have come to realize that the industry here in the Pacific Northwest is subject to the same influences that affect any other branch of agriculture, and that we must expect and be prepared for just such conditions as we have had to contend with during the past four or five years, and and the best way to prepare for these conditions is to diversify in such a manner that our orchards can be maintained at their best, and be made to pay all operating expenses of the orchard and living expenses of the home annually from the soil. This is not the time for big exploitations and non-producing improvements, but it is the time for sound judgment and safe, sane management that will give returns. Just as in other lines, the man who can best use his head will best succeed, and those who fail will fail because of lack of knowledge and management.

The Field of Diversification.—Just what is best for an orchardist to com-



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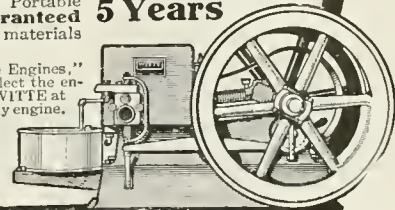
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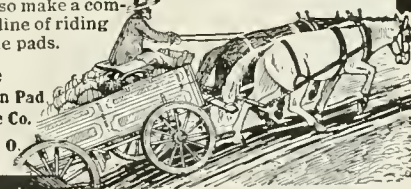
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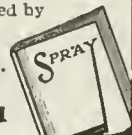
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bine with his fruit work as a side line will depend upon certain factors: (1) The orchardist himself, his likes and dislikes. (2) The local conditions, soil, climate, market, etc. (3) The labor problem, home help, city help. (4) The size of his orchard and age of the trees.

Some people can do more on two acres than others can do on ten; for example, the man who grows fancy head lettuce may succeed better with half an acre than he could with ten acres, while the man who grows corn needs more land, but even he had better grow one hundred bushels per acre on five acres than sixty bushels per acre on ten acres; and thus we could continue the possibilities, but the keynote must be intensification even to the extreme, because our land is so valuable and so full of possibilities that it does not pay to half farm any of it. In the selection of inter-crops it is well to produce only such crops as have two or more possibilities. A concrete example may here be shown in the production of seed corn. The best select ears of the field may be saved for seed, the poorer ears used for hog feed and the stalks fed to the cows or horses; and instead of producing just hogs it usually pays to produce hogs suitable for breeding purposes, which usually costs no more to produce than common or grade stock. A few well-chosen lines, closely united, are better than a lot of poorly-selected, ill-fitting combinations.

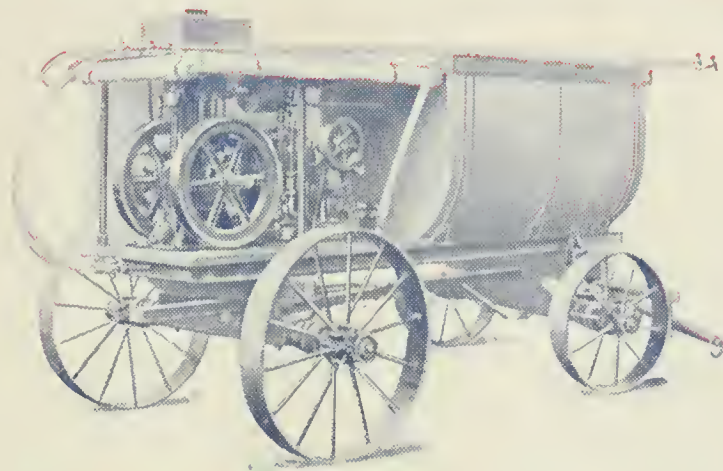
The following combinations have been found to work out very well: (1) Fruit, alfalfa and dairy cows. (2) Fruit, alfalfa and hogs. (3) Fruit, carrots and dairy cows or hogs. (4) Fruit, corn, dairy cows or hogs. (5) Fruit, poultry and alfalfa. (6) Fruit, and sunflowers, or head lettuce, or potatoes, or tomatoes. The livestock combinations with the orchard have a fertilizer value rarely taken into consideration by the laymen, nevertheless it is a real value that should always be taken into account in permanent agriculture.

What, then, is the future of the fruit industry? Nothing for the man who quits. There is only one thing for us to do and that is to stay with the game. If our factors are not right, either make them right or change the policy. Some of the eliminating factors of the average fruitgrowers are: (a) Unsuitableness of the owner and operator. (b) Undesirable varieties. (c) Orchards on unsuitable lands. (d) Orchard in unsuitable climates. (e) In isolated districts. (f) Poor planting plan, making economic management impossible. (g) Orchard area too much limited for diversification.

In conclusion will say that just as soon as every orchard farm is compelled to support its hogs, dairy cows, horses and finally its owner, the fruit problem will be solved. I am more optimistic today over the fruit industry than I have been for years, because I know that there are thousands of acres of land planted to trees now in the Pacific Northwest whose fruit will never compete with the orchards that are now receiving good care.

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The Western Triplex is the all-around sprayer. The detachable truck can be used for general farm purposes as well as on the sprayer. Its ample power and capacity meets the requirements of the largest growers.

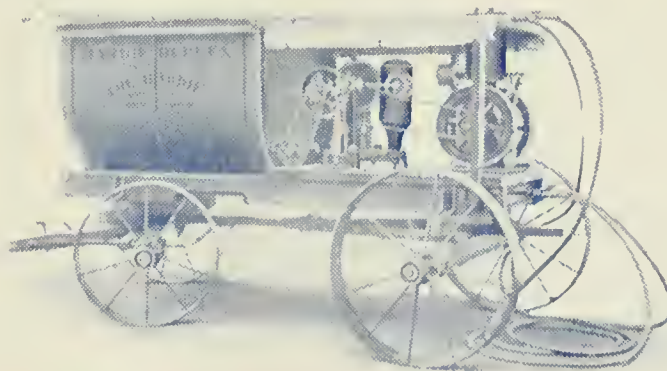
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FOURTH—Taking our entire holdings we handle more high-class stock than any house in the country.

FIFTH—We personally select our fruit in the growing centers, not so much with the sureness of profit as for the certainties of excellence and the belief that we know what our trade deserves.

SIXTH—The growers from whom we purchase get ideas from us as to what the very finest trade want and they know that we have helped raise the standard of excellence of the fruit industry.

But as to being proud—we are most proud, not only of our customers, but also of the growers, without whose help our efforts would be practically in vain.

We believe we have succeeded in assembling under our direction the very best packs of box apples from the premier districts of the Northwest.

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BETTER FRUIT

VOLUME X

FEBRUARY, 1916

NUMBER 8



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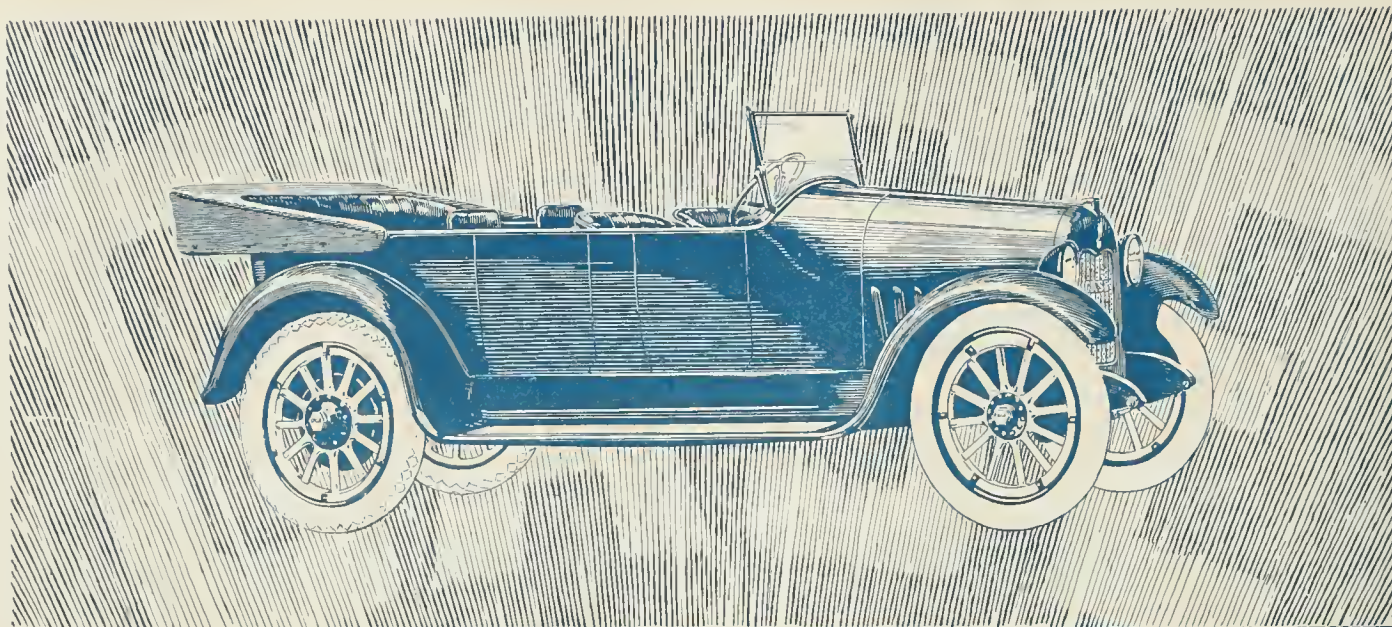
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FRAME: Designed with exceptionally deep section, greatest depth at center where front hanger of cantilever spring is suspended.

SPRINGS: Rear—Cantilever, 50 inches long, $2\frac{1}{2}$ inches wide; attached to rear axle by means of universal joints, which take all side play, allowing springs to do full spring duty—an exclusive feature in construction.

WHEELS: 34x4 inch, Artillery type, with Goodyear detachable, demountable rims.

BODY: All steel, with removable upholstery of genuine grain leather. Front seats divided, and are adjustable forward and backward, as are the clutch and brake-pedals. Finish—Brewster green, with ivory stripe.

EQUIPMENT: One-man top, with dust hood and quickly adjustable side curtains. Stewart-Warner Speedometer. Windshield—Rain vision, ventilating. Tires—Goodyear 34x4 inch, non-skid on rear. Motor-driven horn. Regular tools, tire repair kit, etc., etc.

PRICE: \$1090, f. o. b. Racine.

Tomorrow's Car Today

Now comes the new Case 40. Born and bred in the midst of Case ideals, it looms forth as a car that is bound to carry the Case Standard even higher and higher.

While quite different—while lower in price—the new Case 40 is designed for the substantial sort of man who is not swayed by passing innovations—the man who is cautious and wants a tried, riskless car. For 74 years Case executives and workmen have been building according to Case standard—never leaving that straightaway path called Quality which has brought such world-wide reputation. The Case Cars are built entirely by Case trained workmen in the Case plants.

"Friends of the Forty"

Everywhere are men who know the former Case 40—men who found it well worth \$2300. These men particularly will welcome this announcement—for now they can recommend the new Case 40, with its obvious improvements, to their friends. Owners will tell of its serviceability of its modest upkeep and how it resists depreciation. The splendid service of the former Case 40 can be expected of our new 40.

The refinements of this car are individual. Its combination of excellencies is bound to be appreciated and wanted by the motor-wise and discriminating. We predict a well-deserved sensation for this car.

An Ovation is Certain

At \$1090—over a thousand dollars less than our other 40—we offer this new Case 40—knowing that men who compare values closely and who look for long-lived cars will say, "Here is a car I must know." And we say—"The more you know of this hundred thousand mile car the better."

We invite minute examination of this car. Then you can go over it point by point. You will find it well worth while, we believe. Preliminary data we shall send at your request.

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You just breathe in fragrant, cool puffs of Prince Albert!

It's so easy to smoke; so easy to get acquainted with and call by its first name; so gentle and friendly to your tongue and throat! P. A. will absolutely delight you in a jimmy pipe or rolled into a cigarette; it will revolutionize any tobacco notions you ever had! The patented process fixes that—and *cuts out* bite and parch!

PRINCE ALBERT

the national joy smoke

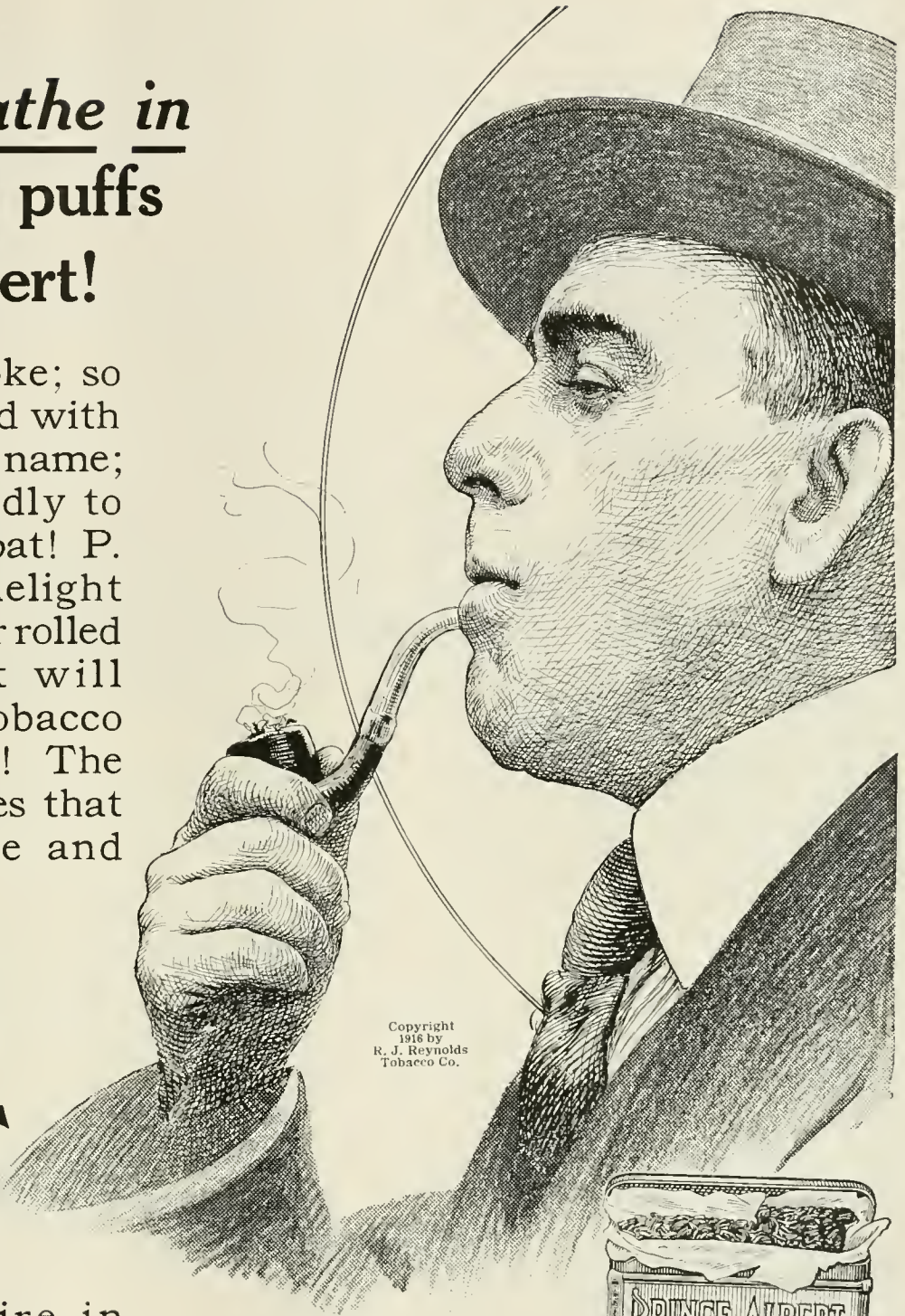
satisfies every desire in your cigarette makin's or jimmy pipe department.

Roll some makin's cigarettes. It's easy, because Prince Albert is crimp cut, *and stays put!* Or jam a jimmy pipe brimful and get the delights of P. A. via the briar, corncob or meerschaum! It's all one and the same when it comes down to the amount of tip-top-joy *per puff!*

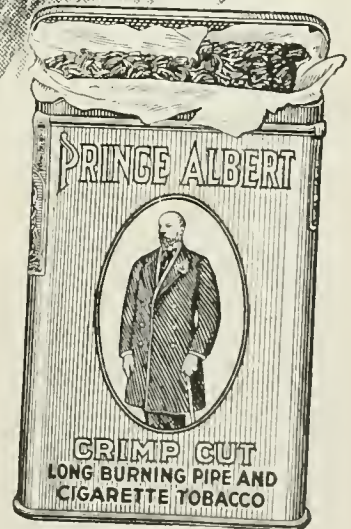
Buy Prince Albert everywhere tobacco is sold in toppy red bags, 5c; tidy red tins, 10c; handsome pound and half-pound tin humidors—and—that corking fine crystal-glass humidor with sponge-moistener top that keeps the tobacco in such clever trim—always!

R. J. REYNOLDS TOBACCO CO., Winston-Salem, N. C.

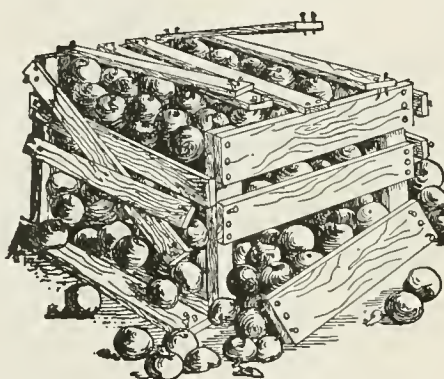
WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



Copyright
1916 by
R. J. Reynolds
Tobacco Co.



On the reverse side of this tidy red tin you will read: "Process Patented July 30th, 1907," which has made *three men* smoke pipes where *one* smoked before!



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

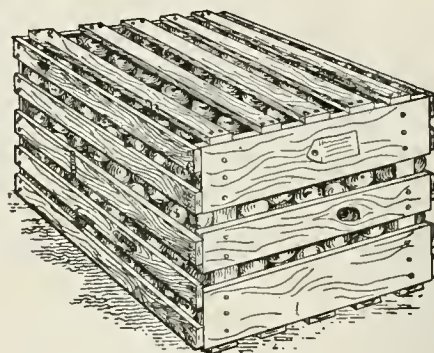
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
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AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

The First National Bank

Hood River, Oregon

Capital and Surplus
\$135,000

4% Interest Paid on Savings
and Term Deposits

F. S. STANLEY, President
E. O. BLANCHAR, Cashier

Pacific Coast Agents
United States Steel
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J.C. Pearson Co., Inc
Sole Manufacturers

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PEARSON

ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.

ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.

ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

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LESLIE BUTLER, President
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Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital \$100,000.00

4% Interest Paid in our Savings Department

WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

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204 Franklin Street, New YorkSimons Fruit Co.
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46 Clinton Street, Boston**OUR SPECIALTIES ARE APPLES AND PEARS**

The Old Reliable

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Our Specialties are

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Spraying Oranges in the Transvaal, South Africa.



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A Bean at Hawkesbury Agricultural College, Australia

"BEAN" POWER SPRAYERS

"Used Round the World"

In the orange-growing sections of the Transvaal, South Africa—in the lemon groves of Southern California—in the vineyards and fruit-growing sections of old New York State—in the grapefruit groves of Florida—in the orchards of Australia—wherever fruit is grown and spraying is required there you will find the Bean at work. Bean outfits are

Noted for Downright Dependability

There are 30 years of experience back of the Bean line—30 years of steady improvement and constant betterment. They have many distinctive, important advantages—many of them found on no other outfits. We call your attention especially to the following:

BEAN PATENTED AUTOMATIC PRESSURE REGULATOR—which ends all safety-valve troubles. Absolutely safe and certain. When nozzles are shut off, the liquid is simply pumped back into the tank, without being put under pressure. Saves fuel and much wear and tear on engine and pump.

BEAN PATENTED THREADLESS BALL VALVES WITH REVERSIBLE SEATS—Simply bell metal balls which cannot stick, corrode, or give trouble. Reached in two minutes without stopping engine and withdrawing liquid.

PORCELAIN-LINED CYLINDERS—cannot be injured by any liquid.

NO STUFFING BOX—hence the source of much sprayer trouble is entirely eliminated.

UNDERNEATH SUCTION—which greatly increases capacity; never requires priming; and makes it possible to empty tank in a few seconds.

BEAN REFILLER—Fills 200-gallon tank in five minutes.

ECCENTRICS INSTEAD OF CRANKS—More durable than cranks and wear can be easily taken up.

BEAN ROCKING BOLSTER—Wheel on either axle can be in rut without tipping tank or springing frame.

DIRECT CONNECTED ENGINE AND PUMP—Saves power. Pump and engine are bolted direct to steel frame, giving perfect rigidity. Frame is bolted direct to axle, saving 6 inches in height and 150 pounds in weight.

INTERCHANGEABLE PARTS—All parts can be quickly and economically substituted for those that become worn.

NOVO ENGINE—The simplest, sturdiest, most efficient little engine on the market, and unsurpassed for sprayer use.

Bean Sprayers Made in All Sizes

We make a complete line of Power Sprayers at from \$100.00 up—as well as Hand and Barrel Pumps, Nozzles, Hose and all Pump Accessories.

Our new catalog describes the entire line and explains fully the new 1916 improvements. Send the coupon.

Bean Spray Pump Co.

213 Hosmer Street
Lansing, Mich.

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Immediate Deliveries from Stocks at Many Northwest Points

Send this Coupon for New Catalog

Bean Spray Pump Co.,
213 West Julian St., San Jose, California.
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Gentlemen: Please send me your 1916 Catalog of Hand and Power Sprayers. I have.....acres of.....trees, and am interested in Hand Pumps..... Power Sprayers..... Accessories.....

Name

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

The Influence of Supply on Prices

A. T. Chaney, General Manager American Cranberry Exchange, New York, before Twelfth Annual Meeting of Western Fruit Jobbers' Association.

MY experience has been confined largely to the marketing and distribution of fresh fruits, and to these I shall apply my subject. The price of foods that are considered prime necessities, such as grain, potatoes, meat, eggs, butter, etc., I believe to be less easily influenced by the supply, and much less by the weather, than of fresh fruits that are considered luxuries, such as strawberries, peaches, pineapples, cranberries, apples, grapefruit, oranges, etc. We must concede that the market price of any article is determined by the law of supply and demand. The demand, I believe, affects the price on fresh fruits more quickly than the supply. Then let us first discuss what influences the demand.

The demand for fresh fruits is influenced by weather conditions, quality and appearance, packing, container, advertising, stability of market and the price. The weather is often a greater factor than the price in creating or retarding the demand to an abnormal degree. For example, lemons, cantaloupes, strawberries, etc., are in greater demand when the weather is hot; whereas apples, cranberries, sweet potatoes, cabbage, etc., enjoy the greatest demand in cool weather. Ask almost any market expert to hazard an opinion as to the probable market price of fresh fruits even as much as one week ahead, and he usually prefaces his answer by providing for weather conditions. The United States Weather Bureau is of invaluable assistance to marketing men by the issuing of dependable weather predictions a few days in advance. I am sure it is the wish of all fruitmen that the time is not far distant when the Weather Bureau will be able to give us reliable predictions two weeks in advance. In determining the proper price for future deliveries normal weather conditions only should be considered.

The quality and appearance of fresh fruit more easily influences the desire of the consumer than the price. The desire seems to be more easily created by sight than by taste. Quality and packing of fresh fruit is of such importance that proper standards of quality or grading of all varieties of fruit and produce should be established, either by the government or by growers' or trade organizations. Producers everywhere should be educated to the supreme importance of quality and appearance. Fruit should be picked in prime condition, and it should be stored and packed so that it will reach the consumer while it is attractive and sound.

Good packing influences the demand decidedly. The highest quality of fruit often has a large per cent of its value wasted by careless, improper packing, even though packed in proper packages. Much of the trouble is caused by lack of knowledge of how to pack properly. Especially is this true among the small growers. Much of it is caused by growers' inability to secure experienced, trained packers. This is especially true in new producing districts. Some of the poor packing is caused by the lack of appreciation of the producer as to its importance, and coupled with this is his desire to pack cheaply, and such an offender usually disregards advice until he has tried out all markets and various sales agents in an effort to get full price for cheaper packing. To some degree every shipment of poorly-packed fruit reduces the value of all receipts of similar fruit in the market that it reaches.

The container should be such as will best insure the safe transportation of its contents, be of convenient size, and be neat and clean in appearance, and when opened it should so display its contents as to attract the consumer's attention. The necessity of national standardization of containers is constantly growing in importance. Standards of measure greatly vary in different states and communities. Shipments of the same commodity may reach a market like New York City on the same day from many different states, packed in almost as many different styles or sizes of containers, according to the custom or state law. Under such chaotic conditions proper prices can hardly be determined and unnecessary annoyance and waste of values is the natural result. The last U. S. Congress, influenced by the urgent solicitation of the United States Bureau of Weights and Measures and various growers' and trade associations, enacted a national mandatory barrel law, giving us a standard barrel of all fruits and vegetables. I trust this is the forerunner of a national standard container for all fresh fruits.

The advertising feature affecting demand is of more importance than many producers and dealers appreciate. The seasons for some of our very best fruits are short and often they are half over before a large part of the consuming public knows or realizes what fruits are "in season." A great many retail dealers fail to buy or display a variety of fruit until they begin to have call for it from the consumer. Often this is the sole cause of slack demand and

abnormally low prices during the first part of the season. By advertising at the proper time in ways that will attract the notice of retailers and consumers, the demand is greatly increased.

The stability of market, when possible to secure it, I believe, goes farther toward encouraging the jobber and retailer to push sales and take special interest in a fresh product than anything else. It is my observation that the consumption of fresh fruit, perhaps more than anything else, increases according to the degree the sale is pushed. The rapidly-increasing crops of fruits make it imperative that a demand be created that is far beyond the natural call. There is a vast difference between the sale of fruit which the dealer simply has for sale for those who come to inquire for it than there is for the fruit which the jobbers must dispose of by sending out salesmen to solicit orders from retailers, because, in addition, the salesman should inform the retailer as to what is in the market and what is due to arrive soon, and enthruse the retailer, in turn, to solicit the consumers' consideration.

The jobber and retailer are the natural acting salesmen for the producer, and on these salesmen's efforts the growers' interest depends. They are the necessary connecting links between the producer and consumer. The interest they take in pushing the sale of fresh fruits is naturally influenced by the certainty of their remuneration. The smallest liability to loss and the greatest certainty of a moderate profit interest them more quickly and certainly than the possibility of large profits, coupled with the danger of serious losses. They are somewhat like a certain United States congressman who had been a leading attorney in his home district. A friend asked him how he could afford to give up his law practice for a congressman's salary. He answered: "The salary is almighty regular." Dealers are often severely criticised for charging seemingly exorbitant profits on fresh fruits. The frequency of violently fluctuating values and heavy shrinkages causing such a large per cent of loss, make margins which appear unreasonable necessary. Large corporations or organizations and close co-operation among both growers and jobbers in order to regulate the supply and distribution so that all fresh fruit and produce may reach the consumer while in prime, palatable and attractive condition (giving the consumer true value instead of wasty, decayed and unsatisfactory food)

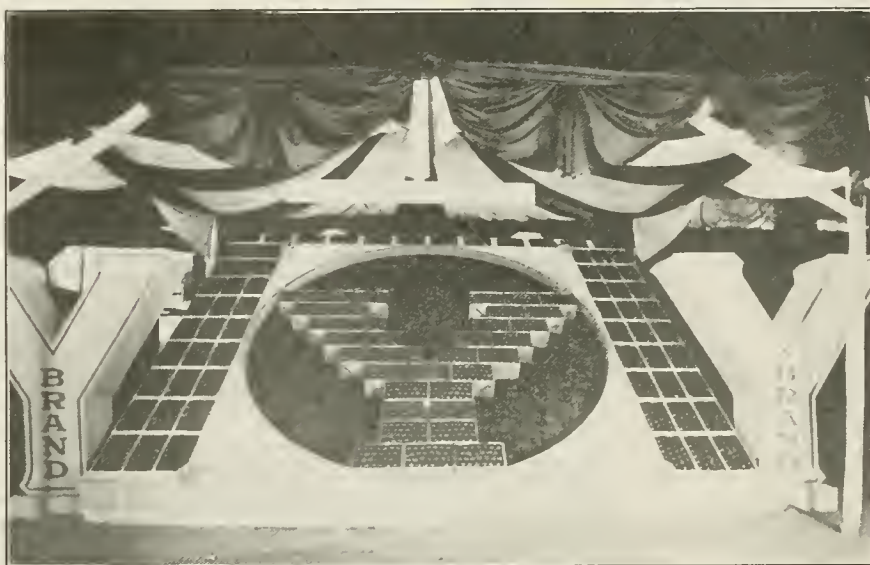


Exhibit winning the first prize, made by the Yakima Valley Fruit Growers' Association at the Eighth National Apple Show, held in Spokane November 15 to 20, in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples it is offering on the market.



Exhibit of the Spokane Valley Growers' Union in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples that it is offering on the market. This exhibit won second prize at the Eighth National Apple Show, held in Spokane November 15 to 20, 1915.

would tend to establish this market stability, broaden distribution, increase the interest of dealers, greatly increase consumption and reduce the present necessary margin of profit or cost between producer and consumer more than any other system. One salesman for a large jobbing house distributing a full line of fruit and produce could easily visit thirty city retail dealers in a single day and fully inform each of the thirty concerning all fruits and produce in the market and due to arrive. Moreover, he could take orders from each of the thirty for delivery on the following day. One to three trucks could make deliveries to the whole thirty on a single trip.

Today in our large market centers each of these thirty retailers must go to market and send or take his truck and secure and haul his own supplies for the day. This system takes the valuable time of the thirty retailers from their stores and thirty trucks to do the work that one salesman and from one to three trucks could do better. Mr. Retailer can, if he wishes, and often does, buy his supply from second-hand dealers, from what is known as a wagon peddler who has bought a load of truck on the market and peddles it out to retail dealers for such profit as he can command. Such retailers must be content to have "on sale" the limited assortment which he can secure from the peddler wagon. To

economize time, Mr. Retailer, who goes to the market, often makes two trips a week and plans to buy a sufficient supply to last until the next regular trip, thus causing what is known as the "big days" on a market. Naturally, such a system does not insure a full daily supply of strictly fresh stocks in the retail places.

Much of the fruit is shipped from the producing point to what are known as "receivers" in our large centers, and then sold by the receivers through independent auctions to jobbers, and then by the jobber it is sold to either the retailer who comes to the market and buys and takes away his supplies, or to the wagon peddlers, who, in turn, sell to the retailers, who, in turn, sell to the consumers. How much more simple and economical in time, expense, profits, and how much less deterioration would take place if the fruit or produce could be shipped to large jobbing houses in the first instance and by them sold and delivered direct to retail dealers. Right here is where I believe the present system of marketing in great centers is out of date and economically wrong. I believe the auction system is our greatest disturber of market stability, and does little to encourage trade or consumption. Indeed, more modern methods should be fostered. The fruit-growing industry has increased in a few years to enormous proportions, but marketing and distributing facilities have not kept pace with this growth, so the industry is suffering great waste and loss for lack of proper marketing equipment. Because of the perishable nature of fruit and because the industry has been considered a peddler's job, the large capitalists have not been attracted to it as they have to meat, grain, etc. This, I believe, is what the country is in great need of, and should be encouraged.

The price is perhaps the last, but not the least, item to consider in influencing demand. The desire for our fruits must first exist in the mind of the consumer and then the price must be within his means to insure his purchase, and it must be in proper relation to values of competitive foods. The question of the high or low prices of food is a psychological one, and the haphazard, random statements frequently appearing in the newspapers and magazines that, at best, deal only in generalities and seldom touch the facts as applied to fruits, is one of the factors in destroying demand, because the consumer assumes through repeated reading that a commodity is high when in reality it is low. There is, however, always a high point in values, where, if it is reached, the consuming masses will turn to substitutes and a later reduction in price will seldom bring back the consumers' favor during that season. Marketing men generally understand the serious danger of a high price diverting consumption away from their product.

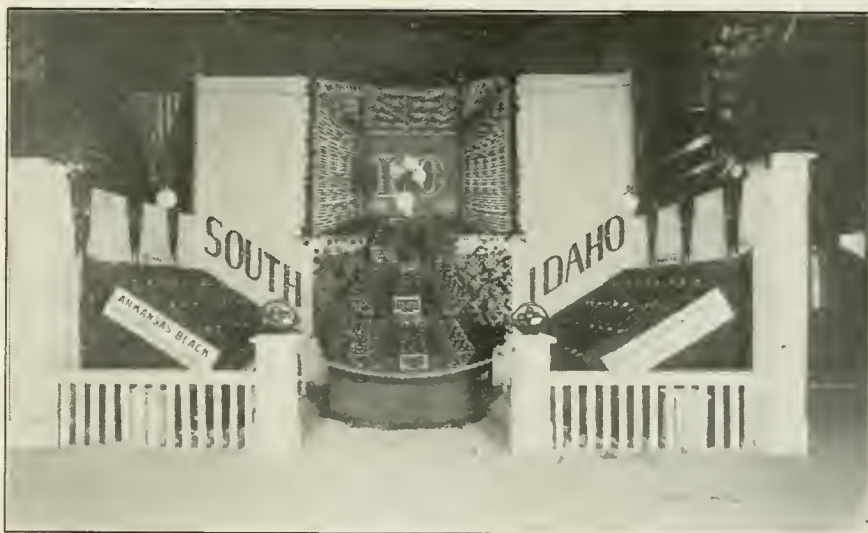
Example: During the cranberry season of 1912 I addressed the following

query to two hundred retail dealers throughout the United States: "Supposing the retail price of cranberries is $8\frac{1}{2}$ cents per quart, or three quarts for 25 cents, please state what reduction in your sales would result from advancing the price to 10 cents per quart, $12\frac{1}{2}$ cents per quart, 15 cents and 20 cents." I received ninety-two replies and from twenty different markets located in sixteen different states. The average of these replies showed that the estimated percentage of decrease of sales as price advanced was as follows: Advance from $8\frac{1}{2}$ cents to 10 cents per quart, reduced sales 12%; from 10 cents to $12\frac{1}{2}$ cents, 23%; from $12\frac{1}{2}$ cents to 15 cents, 37%; from 15 cents to 20 cents, 67%. This same inquiry was made by the Hon. J. A. Gaynor of Grand Rapids, Wisconsin, a prominent cranberry grower, to one hundred retailers in the State of Wisconsin in 1906, with the following result: Advance from 10 cents to $12\frac{1}{2}$ cents per quart, reduced sales 49%; from $12\frac{1}{2}$ cents to 15 cents, 74%. The difference between Mr. Gaynor's figures of 1906 and my own of 1912 may be because of increased regular cranberry consumers in the later year, or by the difference in the purchasing power of the dollar.

The supply is not appreciably affected by price, except as prices reach abnormally high levels and draw supplies from remote sections, or by abnormally low prices diverting away from a given market supplies intended for it, retarding shipments or preventing shipments altogether by the price being below the cost of packing, transportation and marketing expenses. A decreased supply is less likely to cause an advance than an increased supply will cause a decline. The price may be so adversely affected by the supply of fresh fruit and vegetables being thrown on the market in excess of the demand that, in order to secure and insure any stability of price, the control, or partial control, of the supply seems absolutely necessary, and so necessary that I believe the government should recognize its necessity and extend to agencies marketing for the growers the same latitude extended to the growers themselves in the way of permitting and encouraging their organization for exchange of information and control and regulation of distribution. Most of our fruits and produce cannot be held long in prime condition, even in the best of cold storages. They must be sold while they are sound and attractive and cannot be held for ransom. Thus monopolies on fruits are an impossibility because of the very nature of the goods. Moreover, policies of conservation are necessary if the producer is to reap any reward for his labor and if the consumer is to have a fresh, fine article at a stable, reasonable value without fluctuations which destroy or adversely influence the demand. The control of the supply should be legitimate and only sufficient to maintain the demand relatively to the crop produced. The business of trading in fresh fruits and



Exhibit made by the Wenatchee North Central Distributors at the Eighth National Apple Show, Spokane, in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples that it is offering on the market.



The Idaho-Oregon Fruit Growers' Association exhibit at the Eighth National Apple Show, Spokane, November 15 to 20, in the apple shippers' 100-box contest for the most striking advertising display of the brand of Extra Fancy apples that it is offering on the market.

vegetables is probably the only one in which supply and demand entirely control values.

There is always a low point reached, in case of an oversupplied market, where no lower price will increase the sale. The consuming masses under any marketing system now in vogue in large centers cannot be made to respond with sufficient demand to relieve a glutted market before the fruit or produce has so deteriorated as to be unattractive to most of the consumers, if not unfit for food. This fact explains the reports of carloads of fruit or produce which are being dumped while price in uptown retail stores is but slightly changed. The commission merchants or receivers must bear the burden of unjust criticism. Price of fresh fruit can be so low, caused by excessive supply, that there is no room for profitable margins to commission merchants,

jobbers or dealers; hence the trade will not use much effort to sell them and will bend all their energy to sell other things in which there is a profit. From this cause often rises the statement that when prices are high more fruits sell than when they are low. Last summer potatoes were very cheap and netted a price to many growers below the cost of production. I heard more than one grower and dealer remark that people did not seem to eat many potatoes when they were so cheap.

Marketing men, I am sure, will agree that a large supply under proper control can be distributed to the markets of the country at much better prices to the producers and at perhaps as low cost to the consumer, and to greater satisfaction and more certain profit to the dealers, than a smaller supply uncontrolled or unguided. A very great deal of waste and heavy losses con-

stantly occur by shipments being sent at random, totally without regard to the demands of such market for that variety or grade. Markets greatly vary in their demands for character, variety and color of fruits, according to the customs of the people and tastes previously acquired, and this knowledge is of vital importance in supplying their requirements.

Supplies are often forced on the markets unduly by the necessity of getting money for the producers to pay picking and other expenses. The difficulty growers have in borrowing money from their home banks has much to do with this. Some kind of government aid in this direction might be of good service.

The Season's Opening Price.—The season for many of our fruits begins with light shipments and the supply for the first few days, which is unequal to the demand for the first arrivals, causes abnormally high prices being paid for the first deliveries, and this

act establishes the price at retail at too high a level. The retail dealer, because of his custom to have a uniform average price, instead of changing his price from day to day as the wholesale market fluctuates, is slow to reduce his opening price, and thus the high price fixed by the first small shipments retards the free consumption that the heavy supply in the midst of the season greatly needs. When a commodity is under at least partial control all efforts should be made by competent authority to determine the right price in proportion to the season's total production and maximum consumption, which will distribute the entire crop over the whole marketing season, and which will insure, so far as is possible, stability in market conditions, making it safe for dealers to operate freely on reasonable margins of profit, and furnish consumers with prime fruit at reasonable prices. The wrong price results in fluctuations in supply and demand which cause the consumer to

pay excessive prices for good fruit in times of scarcity, or frequently to receive stale, unpalatable fruit at prices out of proportion to the ruinously low prices obtaining in wholesale markets in times of glut. The right opening price would yield maximum returns to the producers as a whole, so any price above or below that right price lessens the money received and injures the grower, the legitimate dealer and the consumer. The loss caused by a too low or too high price is in wasted effort and by wasted or deteriorated material. The government and producers' and dealers' associations should more and more foster such a control as will restrain early shipments of fruit until it is of sufficient maturity to be good food and then render all aid possible in determining proper values being established. It is safer and more beneficial to all, in the end, to start the price too low, rather than to endanger an ample demand by placing the price too high at the start.

The influence of supply on prices is dependent upon the natural and artificially-created demand upon the control, or lack of control, of the supply and the facilities for and manner of distribution. The natural demand is mostly influenced by weather conditions and the quality and appearance of the fruit, and the artificial demand is created mainly by the efforts, good will and energy of the middlemen or salesmen, by advertising, and by the price. The facilities and equipment for distribution should be such as will deliver the fruit from the producer to the consumer with the least delay and least handling and rehandling that can be made practical. The present average yearly production of fruits is so near the present maximum consumption under existing marketing methods as to seriously endanger the possibility of marketing the whole output at prices profitable to the producers, and serious consideration should be given to all possible improved and economical methods of marketing. Jobbers having a very large capital are needed to facilitate most economical distribution in our large cities. National standardization of weights and containers should be established. Close co-operative control of supply and regulation of distribution should be permitted and fostered by the government to lessen the risks of dealing in fresh fruits and vegetables and to aid in establishing stability of values.

Pruning the Bearing Apple and Pear Trees

Continued from last issue

The Application of Pruning Principles to Particular Problems

The application of these principles to the particular pruning problems presented by individual trees is a matter requiring good judgment. However, if some of the principles underlying pruning practices are understood serious mistakes are much less apt to be made. From the discussion of these

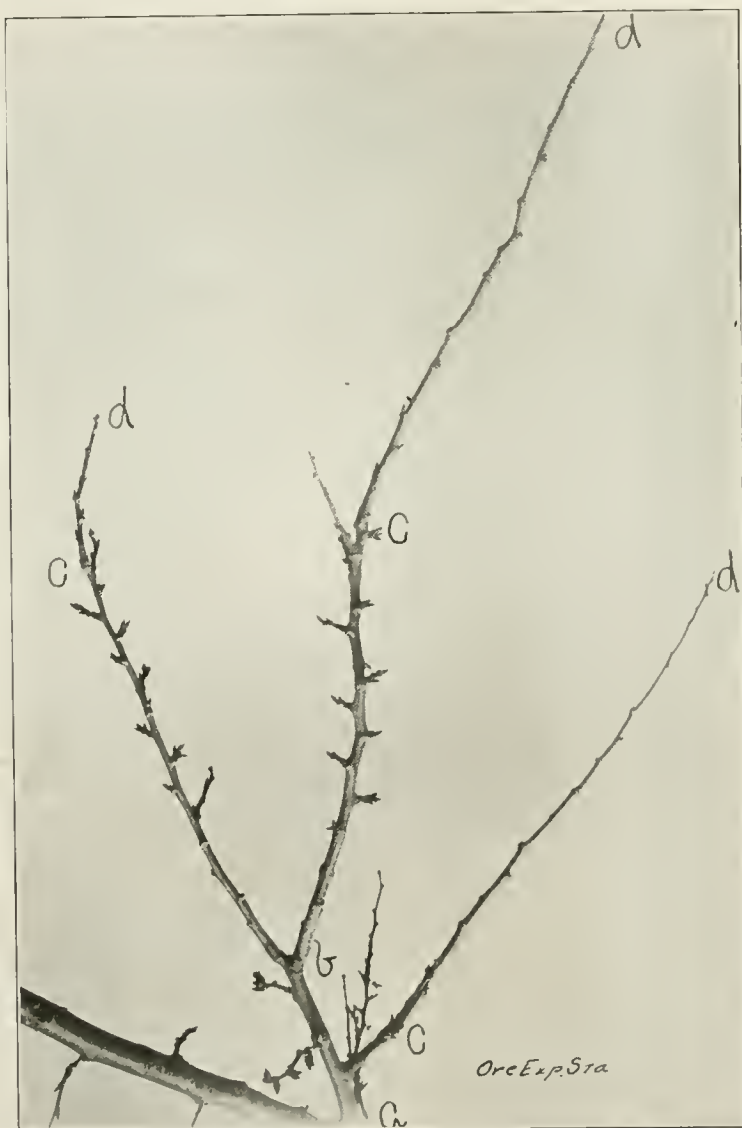


FIGURE 49—A small limb from the top of an Italian prune tree, showing how spurs develop from the shoots of the preceding season. From a to b is three-year-old wood. Two years ago three shoots, b to c, and two fruit spurs were formed. Last year three shoots, c to d, developed from the terminal buds of the preceding season's growth and a number of fruit spurs from its lateral buds. The lateral buds on these fruit spurs are fruit buds; the terminal buds are leaf buds.

principles, it would seem that one of the first things to observe before pruning a tree is whether or not it already possesses a fairly good balance between vegetative growth and fruit production. If it possesses this balance it should be maintained. This would probably mean a moderate heading back of some of the new shoots, especially the more wayward ones, with the idea of maintaining and developing the shape of the tree and mildly stimulating vegetative growth. It would also mean a moderate thinning out to encourage the development of a reasonable number of fruit-spurs, and to afford conditions favorable to the long life and regular bearing of those already formed. If the tree has been growing too vigorously; if it possesses a large number of strong shoots; if it has been producing many watersprouts; if its fruit-spurs are few in number and irregular in bearing, the practice in pruning should be such as will develop new fruit-producing machinery—fruit-spurs—and invigorate and strengthen that already in its possession. This probably means very little heading back and only a light thinning out the first season. This treatment would stimulate the development of a large number of new spurs and could be followed one or two years later with a somewhat heavier thinning of branches, to strengthen and invigorate the older spurs. Many would object to this method of treating over-vigorous trees, fearing that if they were not to head back the shoots generally it would result in their growing "beyond bounds," or becoming "rangy." It is believed, nevertheless, that it is the most certain method of correcting the over-vigorous condition of many fruit trees. A year or two later, when the tree has become fruitful, its top can be gradually brought "within bounds." The willowy or pole-like character of some of its branches can be corrected by heading some of them back severely, cutting into two or even three-year-old wood. It would probably be a mistake to cut back a large proportion of the branches in any one year thus severely, but if the practice is extended over several years it is reasonable to believe that little injury would follow.

On the other hand, if the tree shows evidence of continued neglect, if it possesses large numbers of old but irregular-bearing fruit-spurs; if it has been making very little shoot growth, pruning should be such as to stimulate vegetative processes. Thinning out in this case will take the form of removing old branches with their fruit-spurs so as to divert a larger amount of food material into those remaining, and also into new shoot growth. It will also be desirable to head back the remaining limbs and shoots more or less severely so as to stimulate still further vegetative activities of the tree. That heading back alone will not prove a corrective for trees of the type just described is well illustrated by Figure 48, showing a tree upon which the experiment was tried. The spurs that have since formed upon the new

growth are strong and vigorous, but apparently the new growth drew so heavily upon the energies of the tree and shaded so completely the old spurs lower down in it that the latter have profited very little by the treatment.

The fact is, it is difficult to conceive of trees of bearing age in which it would be desirable to stimulate fruit production alone and absolutely check vegetative growth, or, conversely, to stimulate vegetative growth alone and



FIGURE 50—An old, much-branched fruit spur in an Italian prune tree. Note that some of its branches are dead; the living ones are slender and lacking in vigor. There are present only a few fruit buds and these are near the ends of the branches. It is probably only a matter of a short time before the whole spur will die. Its present condition is the result of too much shading by the branches above it



FIGURE 51—An old Italian prune tree whose top has been kept thinned out fairly well. Note the presence of small fruiting branches well down on the scaffold limbs as a result. Note also that a large portion of the fruit spurs and small fruiting limbs in this tree are stocky and vigorous

completely stop the work of the fruiting machinery. We desire a proper balance between the two kinds of growth. To maintain it, or even to restore it when it is lacking, usually requires a certain amount of both kinds of pruning, heading back and thinning out. The desirability of the results obtained from mainly heading back or mainly thinning out in restoring the balance in an unfruitful tree of bearing age depends upon how correctly its present over-vigorous or under-vigorous condition is estimated, as well as upon a knowledge of the probable effect of the different pruning practices.

Cheer for Fruitgrowers

"When Fruit Men Get Scared" is the title of an article written by James H. Collins, who spent several weeks here last summer, appearing in *The Country Gentleman* of January 1. But the article bears a message that should be gratifying to all fruit men, of tried districts, and especially cheering to the faithful among the growers of the Hood River Valley.

Mr. Collins visited the most of the apple districts as well as the citrus belts last year. His opening paragraph shows that he observed conditions pretty closely. He says:

"The big crop last year in famous winter-fruit sections seemed to be not apples or oranges but meetings. Long before blossoming time the clans began gathering. From the citrus groves of California to those of Porto Rico the growers came together for debate and organization, as well as for ructions and disorganization, and the apple world was in a ferment from the Rogue River Valley of Oregon to the Shenandoah Valley of Virginia."

In another paragraph he says:

"So the growers everywhere began holding meetings, criticising officers, managers and market methods, withdrawing from old organizations and forming new ones, listening to explanations, plans, dreams. One kind of grower, with a clear head, understood that it was the time to hang on to his interests, even though mortgages and loans made it desperately hard, and with the aid of the banker he hung accordingly. Another type of grower, yielding to gloom and discouragement, talked of letting go, of getting out of fruit into some profitable line, of chopping down his trees and raising grain or hay—on five-hundred-dollar land!"

Then comes the message to growers and shippers and the cheer for the faithful. Extracts from the body of Mr. Collins' article are as follows:

"These are mighty interesting times in the fruit industry. On the surface, with all the clamor and pessimism, it often looks as though everything were going to pieces. But down underneath, the real meaning is reconstruction on a sounder business basis. Old evils in production are being eliminated and broader ideas of marketing are coming in everywhere. The need for organization at home, where fruit is produced,



FIGURE 52—A limb in the upper part of an Italian prune tree. The individual spurs have had an abundant supply of light. Note that not only the individual spurs but also the small fruiting limbs are short, stocky and vigorous. However, it would be desirable to remove a few of the smaller branches to prevent too heavy shading of those lower in the tree

is clearly seen by most growers, because shortcomings are close at hand. The need for organization in the big markets is not so clearly seen, because those markets are far off, little understood by growers, and the factors that make for success or failure, good prices or bad, are not in evidence to them.

"Big crops were a factor in the ruinous prices of a year ago; so was war.

"But it is fairly certain that with better understanding of market conditions by growers and better organization of shipments, there would have been much better prices.

"Nine growers in ten believe that low prices are due to glutting of markets. Real market gluts of fruit like winter apples, which can be stored and held for months, are much rarer than is commonly supposed, and while citrus fruit cannot be held so long, once it is off the tree, it still has a margin of stability that makes it entirely different from berries and soft fruits, which must be handled quickly.

"Seventy-five per cent of all the so-called market gluts of winter fruit,

with falling prices, are probably price scares instead. They can be prevented by better organization of growers and produce men, and that will come as soon as the operation of price panics is more widely understood.

"Under normal circumstances, by skillful organization, storage and salesmanship the Northwest would probably have made some profit on box apples. But individual growers, under pressure of fright or debt, began consigning their fruit to Eastern markets in competition with growers' associations, and in a little while whatever confidence existed was destroyed and prices had dropped to less than freight charges.

"One of the big Northwestern growers' organizations sent a representative through the Middle West selling apples. He found many towns where box fruit had never been handled and sold lots of three to ten cars in such places. Fruit dealers paid association prices and began selling the consumers at moderate margins of profit, to assure steady trade all winter.

Continued on page 40

Spot Diseases of the Apple Causing Much General Confusion

By Charles Brooks and D. F. Fisher, U. S. Department of Agriculture. Read by Mr. Fisher before the Washington State Horticultural Association.

THERE is so much general confusion in regard to the nature, cause and methods of treatment of the various spot diseases of the apple that it has seemed desirable to present a progress report of our studies of these diseases. While we still have very much to learn about these various troubles, it is hoped that what we have already found out may prove of value to the horticulturist and help him to distinguish between the different diseases, that he may shape his control measures accordingly. The disease known as bitter pit is referred to under various names. The Germans were the first to describe the disease and called it "stippin." This name is now in quite general use in New York State. In the United States the disease was first referred to as Baldwin Spot, since the Baldwin was found particularly susceptible to it in New England. This name was first used in Vermont and is in quite general use throughout the country. The disease has been referred to in New Hampshire and Oregon publications as "fruit pit." In England, South Africa and Australia the disease is known as "bitter pit." This term has also been quite generally used in the correspondence of the U. S. Department of Agriculture. The term "pit" seems much better suited to describe the disease than that of "spot," since it is set off from a number of fruit spots by a definite pitting or depression of the apple surface. It also seems desirable to eliminate the word "Baldwin," since to use it conveys the impression that the disease might be confined to the Baldwin variety, whereas the Grimes, Northern Spy, Yellow Bellflower and other varieties are just as susceptible as the Baldwin. This disease has received more attention in recent years than formerly, partly because the other diseases have been brought largely under control by spraying, partly because there is a greater demand for high-grade fruit of good keeping quality, and partly because the methods that have been adopted for producing extra fancy apples tend to increase rather than decrease this particular trouble. It has been extremely difficult to find out the cause of the disease. In the first place, it is of physiological nature, and its occurrence is determined by the general condition of the tree and fruit, and such general factors as these are hard to control in a way to get definite data.

Secondly, there has been a great deal of confusion in regard to the disease because there are a number of very similar spots that have been referred to under the above names, but which differ from one another in nature, cause and means of control. This makes any general statement in regard to the disease of questionable value unless there is a careful description given of the trouble under discussion. Among these similar spots are the

"Fruit Spot," "Jonathan Spot," "Stigmonose," true bitter pit, and the corky pit, or so-called "drouth spot." The fruit spot is characterized by hard, sunken, green or red spots with numerous black specks scattered over the sunken area. It is a fungous disease and is readily controlled by spraying with fungicides. It has never been reported west of the Rocky Mountains, and so far as Washington State is concerned, the disease can be left out of consideration. In spite of this fact, in some cases orchardists in the West have carried on extensive spraying work for the control of bitter pit, following up the Eastern directions for fruit spot, and thinking they were fighting the same disease.

Jonathan Spot is the name applied to very shallow black or brown spots in the skin of the apple. In late stages the spots may become sunken and part of the adjacent flesh involved. Various fungi may gain entrance and hasten the enlargement of the spots. In the West this disease is not generally confused with bitter pit. In some quarters it has been attributed to arsenical spray injury, but this theory of the cause of the trouble has been definitely disproved by the extensive spraying experiments which the Department of Agriculture conducted in the State of Delaware in 1910 and 1911. Blocks of Jonathans were sprayed with different amounts of

lead arsenate to see if the prevalence of the disease could be correlated with the amount of lead arsenate used in the spray. Data was secured on the disease both at the time of picking and after several weeks in storage. No correlation whatever could be found between the arsenate of lead and the disease. In many cases there was more disease on fruit which had not been sprayed at all than upon that which had received the heaviest application of lead arsenate. The disease is of a physiological nature, and is essentially a storage trouble, and therefore is not controllable by spraying. It is greatly reduced by hastening the fruit to cold storage. Our experiments with this disease seem to indicate that factors similar to those involved in the cause and control of bitter pit are closely paralleled in the case of Jonathan spot. These will be taken up in more detail in the consideration of bitter pit. Jonathan spot does not seem to be a desirable name for this trouble, since it implies that the disease is largely confined to the Jonathan variety, whereas Spitzenberg, Yellow Newtown and other varieties are often as badly affected. In the interest of clearness it would be desirable to eliminate, if we could, the name of any particular variety of fruit from the names of diseases. The term "freckles" has been applied to Jonathan spot, but it has not

Heavily irrigated all season.

Moderate irrigation.

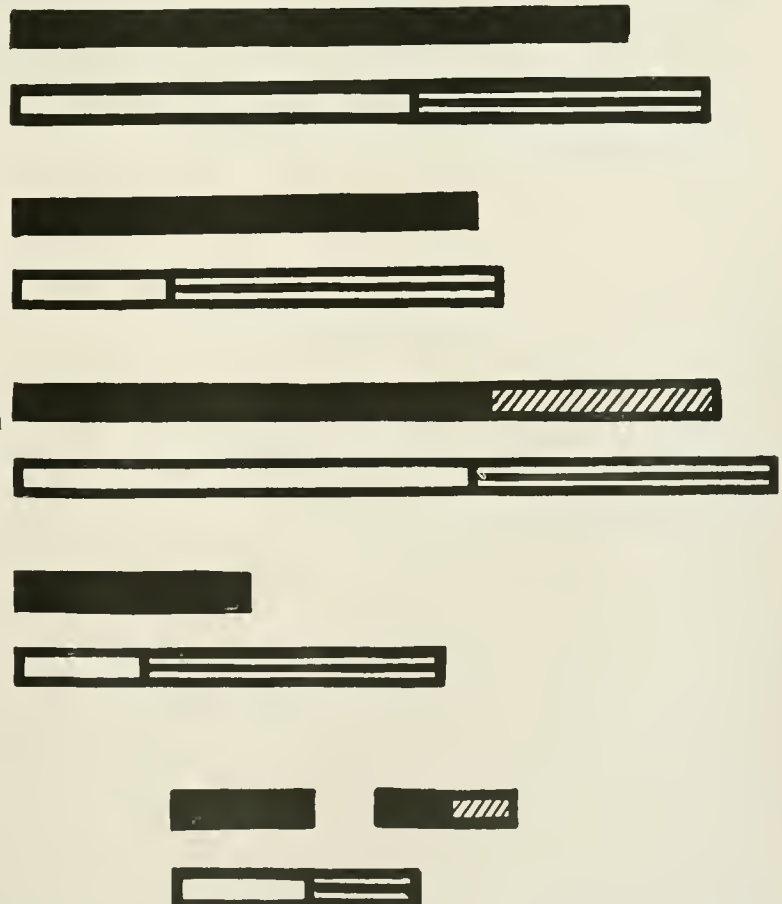
Moderate irrigation until August 1, then heavy until September 10.

Light irrigation.

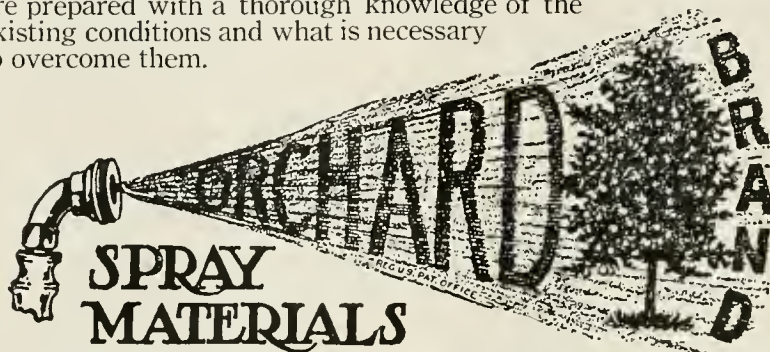
Soil moisture.

Bitter pit.

Chart showing correlation between soil moisture and bitter pit in 1915 experiments on Grimes at Wenatchee, Washington.



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come into general use, so it will perhaps be best to adhere to the commonly-accepted name of the disease.

A great deal more confusion has arisen in regard to the other diseases mentioned above: the true bitter pit, the corky pit or drouth spot, and the stigmonose. These troubles resemble one another very closely in some cases. The true bitter pit appears on mature, or nearly mature fruit, either on the tree or in storage. When found on the surface it causes hemispherical depressions, usually rather circular and uniform in shape. Beneath the skin brown dry spots are found, and this brown tissue may extend down through the flesh of the apple along the conducting vessels, giving the flesh a streaked appearance. Pits may also be found at a depth in the flesh when there is no outward indication of their presence. The pitting is generally confined to the lower or calyx end of the apple.

The corky pit or drouth spot usually has a fairly large area of dead brown tissue. These spots may be near the surface or at a considerable depth. They may appear at any stage in the growth of the apple, but usually become more evident later in the season. At first they are large, irregular shaped, water-soaked spots, often stained a reddish color and usually covered with drops of a yellowish, sticky ooze which is sweetish to the taste. In late stages of the disease the fruit is much misshapen, the spots become very hard and

sunken, while the flesh is brown and corky like an old bruise. In 1913 this disease was first produced experimentally at Wenatchee by subjecting Winesaps to a sudden and severe drouth. In every case since observed it has been found that this condition prevailed before the appearance of the trouble. It was at first thought that these spots might possibly be due to water being turned on suddenly after the drouth, but later observations have shown that they developed before irrigation was again resumed. There is no question but that a sudden shortage of water is the direct cause of the spots. It is probable that the character of the soil may have a modifying influence. The disease is most common on Winesaps, although Staymans and Ben Davis are often affected. Varieties other than these have been subjected to the same circumstances and the fruit reduced to a decidedly shriveled condition without these corky spots appearing. In the East the Ben Davis seems to have suffered more than other varieties from this trouble. The best remedy that can be offered with our present knowledge is that of uniform watering. There is another form of corky pit that occurs on shallow soils in some sections of the East and West. It is common where there is a hardpan at a slight depth, and also where there are peculiar soils outcropping. This disease is quite generally associated with rosette. The remedies that have been suggested are

such as tile drainage, blasting and turning under cover crops.

Stigmonose is a term used to refer to insect injuries to plants. It is used here to refer particularly to the effects produced on apples by sucking insects. The gross characteristics of stigmonose are very similar to those of true bitter pit. The spots, however, are more irregular in size and outline than those of bitter pit, and instead of having a rather smooth, hemispherical depression of the skin the stigmonose is usually a roughened and irregular pitting. It appears earlier in the season than bitter pit and is usually found particularly abundant on those branches where aphids are of most common occurrence. It is not confined to the middle or calyx end of the apple, as is usually the case with true bitter pit. It also differs from bitter pit in that it is seldom found deep in the flesh and that there is no streaking beneath the spots. Our first year's work in Washington State was practically wasted, so far as results on bitter pit were concerned, because experiments were outlined for this disease and carried out in orchards which it had been reported to us were badly affected with bitter pit, but which we later found were affected with stigmonose and not true bitter pit. Within the last year in certain orchard sections of the East large blocks of Yorks and other varieties have been so badly affected with stigmonose that the owners, thinking they had some physiological trouble, were planning to either top work their trees or cut them out, as they despaired of ever controlling the disease. Upon examination it was found that the disease was not bitter pit but a bad case of stigmonose. While the bitter pit and the stigmonose are so much alike in appearance, the manner of control is entirely different. Stigmonose is due to sucking insects. Its occurrence runs parallel with that of the aphids, particularly the rosy-apple aphid. It is sometimes found on the small gnarled apples on the inside limbs of the tree, which have been damaged by the early attacks of the rosy aphid, but it also occurs on other apples that are near these, as well as those in other parts of the tree, and to which the aphids spread later in the season. It has to be controlled by controlling the sucking insects. In order to carry out bitter-pit experiments with stigmonose eliminated we have found it necessary to spray our experimental trees for the control of aphids. This control was accomplished this past year through the co-operation of Mr. E. J. Newcomer of the Bureau of Entomology, who has been associated with us in the stigmonose experiments. We found in one of our experimental orchards, where rosy aphid was particularly abundant, that spraying with Black-Leaf 40, diluted 1-1000 plus lime-sulphur testing four degrees Beaume, and applied just as the terminal buds were becoming green, reduced the amount of stigmonose from 16 to less than 1 per cent. True bitter pit does

not usually appear until the fruit is nearly mature, and often develops in storage, particularly where improper methods are used. It is worse on large apples and on fruit from young trees. Irrigation is a very important factor in its control. In our experiments on this disease it has been found that heavily-watered trees, particularly those watered heavily late in the season, have a much greater percentage of diseased fruit than those receiving medium or light watering.

The following data, showing the percentage of bitter pit present, has been obtained in experiments of the past year on Grimes variety, counts being made twelve days after picking:

Heavily watered throughout the season....43%
Medium supply of water throughout season.....17%
Medium supply of water until August 1, then heavily watered.....49%
Lightly watered throughout season.....14%

After six weeks in cellar storage the amount of disease (bitter pit) had increased to the following percentages:

Heavily watered throughout season.....73%
Medium supply of water throughout season.....54%
Medium supply of water until August 1, then heavily watered.....81%
Lightly watered throughout season.....10%

These results are graphically presented on the accompanying chart, where the soil moisture is expressed in per cent of soil saturation as determined by frequent tests throughout the season. It might be noted in a consideration of the above figures that the results were obtained from five-year-old trees of a very susceptible variety. Practically the same contrasts were obtained in another similar experiment using Jonathans instead of Grimes. Our results in this case differed from the above only in the relative smaller amount of disease occasioned by the differing susceptibilities of the varieties. The production of Jonathan spot, so far as it has thus far been determined, closely parallels that of bitter pit in these experiments. It is evident that bitter pit can be largely reduced in irrigated sections by the proper

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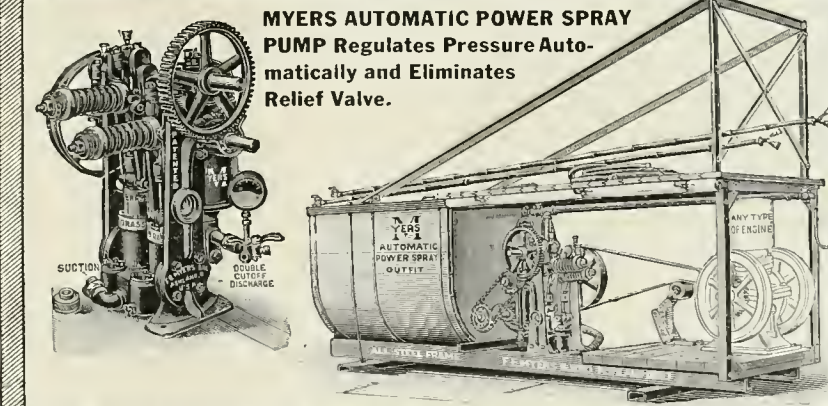
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handling of the irrigation water. There are other factors concerned, however, but our experiments do not justify a report on these at the present time. In storage the disease is partially prevented, or at least delayed in appearance, by prompt cooling. This report on these diseases is not given as a final statement on the subject, as there is yet much to be found out, but there are a few things of practical importance that can be definitely stated. The fungous fruit spot of the East does not occur in Washington, and sprayings with fungicides for spot and pit troubles are unnecessary. Jonathan

spot is a skin disease of a physiological nature. It appears most often after the fruit goes into storage and is not controlled by spraying. Stigmonose is of common occurrence, has been much confused with true bitter pit, and can be controlled by controlling the sucking insects. The control of corky pit or drouth spotting should be attempted along lines of soil improvement and maintaining a uniform water supply. True bitter pit can be greatly reduced by proper handling of irrigation water, that is, by avoiding excessive irrigation, especially late in the season, and by hastening the fruit into cold storage.

Alfalfa in the Orchard, or Better Orchard Farming

By P. S. Darlington, Horticulturist, Wenatchee, Washington.

UP until the last two or three years prices for our Northwestern apples have been good. So good in fact that our fruit farmers of Washington have made good big profits and have done well in a business way, regardless of whether they have conducted their farms upon good, sound business principles or not. We are inclined to lay most of our troubles in the last two or

three years to marketing conditions. As a matter of fact adequate marketing facilities have not kept pace with the rapidly-increasing tonnage of the Northwest. However, in the last year or two a great deal has been said and done along the line of improving our pack, grade, and marketing conditions in the future. But none of us can foresee what prices we are likely to

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gel for our fruit in the next few years. We must hope for the best but be prepared for the worst. On our orchard farms we must start building up a better and more permanent agriculture, an agriculture based upon more economic principles. I mean by this that we can no longer afford to take crop after crop from our orchards without doing something toward improving or at least maintaining proper soil conditions. We can no longer afford to go to town and buy our meat, butter, eggs and garden produce, as has been largely the practice in the past. By building a better agriculture, then, I mean maintaining and improving soil conditions, maintaining and improving crop production, both as to quantity and quality, and living better and more economically on our orchard farms.

If one will take a ride through the older orchard sections during the summer time he can see here and there orchards in which the trees show small, yellowish and sparse foliage, a red or yellowish bark, and probably a light crop of small apples. These are symptoms of improper nourishment or partial starvation. This condition may be brought about by any one of a number of different causes, but whatever the cause the effect is partial starvation. In some cases it may be due to lack of water, but since all plant food must be taken up in the form of solution lack of water is starvation. In a light sandy soil it may be due to too much water, in which case the soluble elements of plant food are leached away before they can be utilized by the tree roots. It may be due to an impoverished soil, but there are comparatively few of our orchard soils but what contain sufficient plant food to properly nourish the trees if the elements of plant food that are in the

soil are made available to the trees. This starved appearance is most frequently due to the fact that the elements of plant food which are in the soil in abundance are, on account of the improper physical condition of the soil, not made available to the tree or plant.

An ideal apple soil is a heavy rich loam. But this type of soil as well as other types, if clean cultivated for a period of years, becomes void of humus or organic matter. The soil particles then readily run together. In this condition the soil breaks up cloddy. It puddles easily when wet. It does not take water readily. In fact a slrta just beneath the surface cultivation will develop which is almost impervious to water and which is almost as hard as hardpan. A soil in this physical condition, though it may be ever so rich in the elements of plant food, will not release or make available to the tree plant food in sufficient quantities to properly nourish the tree. This condition of soil has been brought about by the continuous burning up and almost continuous exhaustion of the humus or organic matter in the soil. This is the result of continued clean cultivation without the addition of organic matter to the soil. The point that I want to bring out most forcibly here is that our soil troubles are mostly physical rather than chemical, and that the addition of chemicals in the form of chemical or commercial fertilizers can do little toward the permanent upbuilding of our soil conditions. Furthermore, without an adequate supply of humus we do not get full benefit of whatever chemical fertilizers we may use.

We may temporarily benefit a crop or our trees by deep plowing or by dynamiting. By such means the soil

is temporarily put in better shape to absorb water. But such results can be only temporary, for without organic matter in the soil to hold the soil particles apart the soil will soon run together and become as compact and as impervious to water as before. To build up and maintain a constant supply of available plant food with the least possible waste we must have a goodly supply of humus in the soil. Humus is decaying vegetation or organic matter. Humus acts as a sponge to not only hold moisture but to hold available elements of plant food. In the decomposition of organic matter various weak acids known as humic acids are formed. These weak acids have a dissolving effect upon the soil particles and change the otherwise unavailable elements of plant food into available form. Humus holds the soil particles apart and prevents the soil from becoming hard and compact.

Now we come to a discussion of correcting the physical conditions of the soil, a discussion of supplying humus in the best and most economical way. We all know something of the benefits of barnyard manure. Barnyard manure



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is not very rich in the elements of plant food. For instance, 66 pounds of nitrate of soda furnishes as much nitrogen as a ton of ordinary horse manure; 20 pounds of muriate of potash furnishes as much potash as a ton of ordinary horse manure, and 25 pounds of ground bone furnishes as much phosphoric acid as a ton of ordinary horse manure. I can readily point to a number of orchards which have shown very plainly the beneficial results from barnyard manure, due probably more to the beneficial physical effect upon the soil than to the comparatively small addition of plant food. However, barnyard manure is expensive, especially if we have to haul it from town, and we cannot all get it in sufficient quantities. Therefore we must turn to other sources of organic matter. This brings us to a consideration of cover crops. By a proper system of cover or manure crops we can undoubtedly furnish the required humus more cheaply than in any other way. In fact the negligent grower, as we used to call him, who allowed the weeds to grow in his orchard every fall and worked them into the soil in the spring and continued this practice year after year has today very much better soil conditions than the grower who has scrupulously clean cultivated over the same period. The weeds have not added any fertility to the soil, but they have kept the soil in better physical condition. Wheat and rye are sometimes used with beneficial results, especially on light or sandy soils which are likely to shift with the spring winds. But these, like the weeds, add no fertility, simply put

back what they have taken from the soil. It is now a matter of common agricultural knowledge that there is a family of plants known as the legumes that do have the power of adding fertility in the form of nitrogen to the soil. Since nitrogen is the element of fertility that is most likely to be lacking in most of our soils and is the element that is the most expensive to buy, and since we find among the legumes plants that are suitable in many other respects for cover or manure crops, it is natural to expect that we should find our most suitable cover-crop plants in this family.

Red clover has long been used as a green manure crop and is highly recommended in general farming districts for such purposes. It has been quite generally recommended for an orchard cover crop and has been quite extensively used in the fruit districts for that purpose. However, results from its use as an orchard cover crop, at least in the Wenatchee district, have not proven generally satisfactory, especially where the clover has been allowed to remain in the orchard for two years or more. This same appearance of starvation as described above usually becomes very apparent after clover has been in the orchard for two years or more. I could cite numerous instances of this condition. Red clover is a shallow-rooted plant. It takes its supply of water and food from the first two or three feet of soil right in competition with the feeding roots of

the tree. While I have no exact measurements of water used it is conceded by practically all that have had clover in the orchard that it requires an excessive amount of water. I believe that the generally poor results from the use of clover are due to the difficulty of keeping a proper degree of soil moisture.

Hairy vetch has a good deal in its favor as a cover crop. It is one of the best nitrogen gatherers, it produces a great mass of vegetative matter and reseeds itself year after year. Orchards that have continued the proper use of vetch year after year show excellent results from its use. I understand that the price of vetch seed at the present time is prohibitive.

I consider alfalfa far superior to any other crop that we now use for cover crop or green manure purposes in our orchards. Alfalfa produces an immense mass of vegetative matter, not only above ground but also below. I believe that it is unexcelled in this respect by any other crop that we can grow in our orchards and, as explained above, it is vegetative matter in the soil that we need more than anything else. Alfalfa is a soil renovator. It is a more successful soil renovator than plow or harrow, or even dynamite. No plow sole forms in an alfalfa field nor in an orchard sowed to alfalfa. Alfalfa roots penetrate the soil to the depth of 20, 30 or 40 feet and have been known to go down to a depth of 127 feet. The decaying roots and side laterals of the

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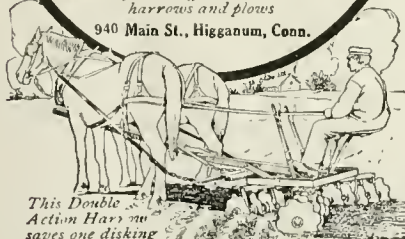
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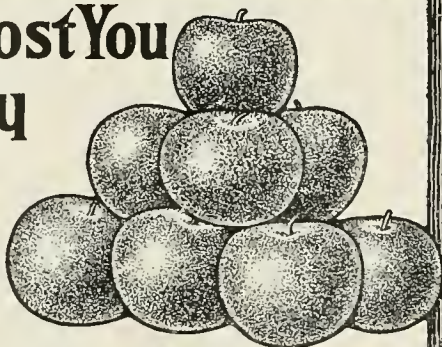
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which are Ben Davis. The Z. A. Lanham orchard is, as near as I can learn, the same age. And as near as I can learn, it had been continuously clean cultivated up until the summer of 1909, when it was sowed down to red clover, and remained in red clover for three years. This orchard contains 833 trees, about two-thirds of which are Ben Davis. This orchard has had good care and apparently better natural soil conditions and location than the Barney & Williams orchard. Below is a comparison of the two bearing records, both of which are exceptional records:

BARNEY & WILLIAMS (ALFALFA)

Year	Boxes
1907	2,300
1908	2,500
1909	3,031
1910	3,300
1911	2,894
1912	3,036

Total for six years..... 17,061
Annual average (150 trees)... 2,343
No. boxes per tree per year... 19

Z. A. LANHAM (CLEAN)

Year	Boxes
1907	5,500
1908	10,000
1909	5,500
1910	11,500
1911	5,500
1912	13,000

Total for six years..... 51,000
Annual average (833 trees)... 8,500
No. boxes per tree per year... 10.2

While these two bearing records may not be conclusive evidence of the effect of alfalfa upon production, they would seem to indicate that at least alfalfa is not harmful to production. I could cite the case of the Bailey orchard just across the road from the Barney & Williams orchard. This orchard produced two or three good big crops, then began to fail. The foliage became pale and sickly looking and small and sparse. For two or three years following this orchard produced small crops of small apples. It was then sown down to alfalfa. The second year after the alfalfa was sowed this orchard produced broad dark-green foliage and a good crop of large apples, and continues to produce good crops. From such observations as these and many others I am forced to believe that alfalfa is beneficial in the orchard. But alfalfa has another advantage. It ranks high in feeding value. In fact we are told that a ton of alfalfa hay has almost as much feeding value as a ton of wheat bran. Where it is possible we might just as well get the feeding value out of it as well as the fertilizing value. Now does all of this mean anything? Yes, this is what it means: Every orchard farm should have at least one family cow, a hog or two, some chickens, etc. We would then have our own milk and cream, butter and eggs and meat, which with what vegetables we can raise in a small corner would constitute a large portion of our living. We would live much better and a good deal cheaper and would at the same time be building up our orchard soils. This is what I call building up a better and more permanent agriculture on our small orchard farms.

alfalfa keep the soil open and porous for the penetration of air and water. Alfalfa is a legume and therefore a nitrogen gatherer. It is probably not excelled as a nitrogen gatherer. But it does more than gather nitrogen from the air—it penetrates the soil far below the reach of ordinary plants and brings up other elements of plant food and makes them available at the surface. It has been estimated at the New Jersey Experiment Station that the amounts of plant food gathered by a test acre of alfalfa in two years were, nitrogen equivalent to that contained in 3,500 pounds of nitrate of soda, phosphoric acid equivalent to that contained in 600 pounds of bone, black superphosphate and potash equivalent to that contained in 1,200 pounds of muriate of potash. This amount of fertilizer purchased at the ordinary cost of commercial fertilizer would cost about \$124, the nitrogen alone being worth about \$105, and this was taken almost entirely from the air. Alfalfa permits of cultivation in the spring when the surface soil should be stirred and allowed to warm up. The soil may thus be put in better shape to conserve the winter moisture. Cultivation does not injure but helps the alfalfa itself. I have no accurate data on the amount of water required for alfalfa in the orchard, although I have made a good deal of observation and inquiry along this line. I am satisfied that if three crops of alfalfa are cut and taken off the land that it will

require more water than clean cultivated land, although I believe that land that is clean cultivated year after year will eventually get in such physical condition that it will be necessary to run more water over the surface of the soil to get it properly soaked in than it requires to produce the alfalfa. I am very thoroughly convinced that alfalfa requires considerably less water than red clover.

I have mentioned all of these as reasons why alfalfa should give good results as a cover crop. Now let us see what it actually does. Some of the most vigorous as well as some of the most productive orchards in the Wenatchee district today are those that have had alfalfa in the longest. I could point out a number of such instances. But for the sake of comparison I have gotten the bearing record of the oldest alfalfa orchard that I know of in the Wenatchee district. This bearing record covers a period of six years. I have also gotten the bearing record of another orchard of the same age and largely the same varieties. The Barney & Williams orchard is now about 18 years old. It was originally an alfalfa field plowed up and set to orchard. So far as I can learn an effort was made for the first few years to keep it clean cultivated, but the alfalfa was eventually allowed to take it, so that this orchard has probably now been in solid alfalfa for 14 or 15 years. This orchard consists of about an acre and a half and contains about 150 trees, most of



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Diversity of Fruit Growing

Professor C. I. Lewis, Chief Division of Horticulture, Oregon Agricultural College, Corvallis, before the Oregon State Horticultural Society.

WE have recently completed a study of the cost of production of apples in a thousand orchards in the Pacific Northwest. In making this study, we gave special attention to the subject of the possibilities of diversifying the fruitgrower's interest. We realize that the production problem simmers itself down quite largely to the proper utilization of labor and teams and the maintenance of an acreage which guarantees cheap production. The amount of diversification that a man can undertake depends very largely upon the acreage of fruit which he maintains and the amount of capital, time and general facilities at his disposal for other lines of endeavor. Possibly, the best form of diversification for the fruitgrower is to diversify more in his own line. Namely, instead of devoting his entire attention to the production of one type of fruit, such as apples, or walnuts, it would be better that he grow a number of types, thus distributing his labor and bringing in cash incomes at various seasons, and eliminating to a certain degree the possibility of lean years. For example, in the Willamette Valley, if he has a prune evaporator, blackcap raspberries or loganberries, prunes and English walnuts could all be dried in the same building and would not interfere with each other. For the slack time which would come in August, he could have Bartlett pears raised for the cannery, or he could take such a combination as berries, prunes, apples or walnuts. In a section like Hood River one could grow such crops as strawberries, cane fruits, cherries, pears and apples. For The Dalles, early berries, cherries, peaches, apricots, green prunes, grapes and some truck-garden crops. For the Freewater-Milton district, dewberries, strawberries, early garden-truck crops, peaches, green prunes and apples. These are merely some of the crops to raise. Others could be raised, and we could work them out for different sections of the Northwest.

To the fruit grower who contemplates taking up general agriculture in connection with fruit growing, I would

warn him against overdoing this proposition. For, unless he makes a careful study of the proposition and is a good business man, he will only lose money, rather than add to his receipts. The great danger to a man who goes into general farming and at the same time attempts the production of fruit, is that his fruit will be of very poor quality. Often Western people point to the diversity of certain Eastern fruitgrowers, but they fail to remember that these same Eastern fruitgrowers produce very ordinary fruit—fruit that would not pay a Western fruitgrower to pay the freight on. It is very doubtful if, on high-priced land, there is a single agricultural production that will pay better than fruit properly grown, and the man contemplating diversification needs to give a little attention to the question of cheap production and efficient business management. On the other hand, the general farmer should go into fruit growing cautiously. There are some exceptions, however. The prune, for example, can be grown very nicely by the every-day farmer and is today the best cash crop on a large percentage of the farms in the Willamette and Umpqua Valleys. The loganberry is another crop which the dairyman or general farmer can grow in connection with other crops, and the English walnut offers a fair field. Occasionally we find a man handling peaches and canning pears successfully, but there are very few general farmers who make a success of apples, pears and sweet berries. Every orchardist should attempt to produce as large a percentage as possible of food consumed on his ranch. This means he should keep a good family cow, at least one pig, a small flock of chickens, and should maintain a good garden in which will be found abundant supplies of asparagus, rhubarb, small fruits, potatoes and seasonal vegetables. From such a combination he ought to be able to sell a considerable excess to advantage.

We will now consider the various opportunities for diversification, and the first we will consider is that of

forage crops in irrigated sections. For example, clover and alfalfa and similar crops can be easily grown in the mature orchards. Our survey, however, points out that when these crops are produced as hay, very little money can be made, and that the most money from these crops is realized when they can be pastured by such animals as hogs or sheep. Sections fortunately situated near good markets can engage to a limited extent in the production of high-grade truck-garden crops. However, the market is limited and it is only occasionally where one can realize money under conditions where it is necessary to employ practically all the hand labor. For irrigated districts, the strawberry has shown itself to be the best money producer. We must admit that sometimes it is a little hard on the trees, but there are many fruit-growing sections that would be better off if they always reserved a portion of their land for the production of such fruits as the strawberry. The potato on the whole has not been very profitable. Occasionally an orchardist makes money, but more of them lose. In only a small proportion of the orchards do we have the right combination of soil and climate for good potato production. A few growers producing seed potatoes have made money. Some of the men in the Grand Ronde Valley have done well in this way. It is very rarely that grain or grain hay can be grown profitably among fruit trees.

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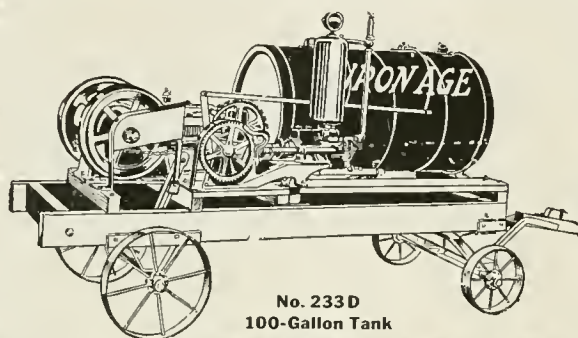


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When marketing conditions are right, the hog represents one of the best propositions for the fruitgrower to consider. This is especially true in Western Oregon, where abundant crops of turnips, vetch, rape, etc., can be grown as winter pasturage and where the soil will stand such pasturing. The hogs are turned off in the spring. Where cheap grain, such as wheat screenings can be procured, hogs have been produced very satisfactorily by some of our orchardists. Where summer pasturage must be resorted to, the question is a little more complicated and the grower is often forced to unload his pork on a very poor market. However, in some of our experiments we have secured very satisfactory results. In a test which we tried at the Umatilla Experiment Farm, at Hermiston, the following results were secured:

For the purpose of determining the comparative value of alfalfa hay and pasture produced by equal areas of land planted to orchard, one-half acre of four-year-old alfalfa was taken. The soil and stand of plants were uniform and no grading was done preparatory to seeding. The tract was equally divided into one-fourth-acre fields, one-half being set aside for the production of hay and the other fenced for pasturing. The pasture plat was divided into two parts of one-eighth acre each. A

small shelter and water barrel were placed at one end of the dividing fence in such manner that by changing the free end of one panel from one end to the other of the shelter they could be thrown into either of the plats. Owing to the flume leading to this land being small, water could not be applied to the entire experiment at one time, but it was irrigated regularly at intervals averaging about twelve days in length. New furrows were made in the hay ground after each crop was removed, and in the pasture plats before each irrigation. Four crops of hay were cut from one-fourth acre, which yielded as follows: First crop, May 22, 848 pounds; second crop, July 6, 838 pounds; third crop, August 3, 534 pounds; fourth crop, September 28, 430 pounds. Total 2,650 pounds, or 5.3 tons to the acre. A yield of 5.3 tons is considered large for coarse sandy soil not influenced by ground water.

The first lot of hogs purchased for use in this experiment were farrowed September 15, 1913, making them 194 days old. They were from the first litter of a young Duroc sow. The sire was of the large type Poland China and both parents were of good breeding. Hogs of the second lot were very similar in ever respect to those of the first. Although not large for their age, they were thrifty and in good flesh when put on the pasture. Total number of days alfalfa was pastured, 190; number of hog days for one acre of alfalfa, 3,040; total pounds pork pro-

duced by one-quarter acre of alfalfa with addition of grain equals 573, which is equivalent to 2,292 pounds to the acre. At seven cents this amounts to \$160.44. After deducting \$28.25, the cost of 1,883 pounds of grain (rolled barley) fed at \$30 a ton leaves \$11.86 to the credit of one-quarter acre of alfalfa. This equals a rate of \$47.44 an acre for the alfalfa by pasturing under the above conditions which were no more favorable than are found on several farms on the project at the present time. At \$7 a ton, which is the sale price of loose hay, an acre income of \$37.10 was received. The value of each ton of hay in terms of alfalfa used as pasture, in view of the above results, would amount to \$8.95. At \$7 a ton for hay, and \$8.95 a ton for hay when used for pasture, gives an increase in value of \$1.95 a ton, or \$7.80 an acre for pasture over that of hay. During one week in April small amounts of alfalfa were cut from an adjacent field and fed to the hogs on account of cool weather checking the growth of forage on the pasture plat. No record was kept of the quantity used, but as it was very small it would make only a slight difference in results of the experiment.

In the above figures no estimate or consideration is made of the comparative labor requirements in producing hay or pasturing. From the farmer's point of view the pasturing gives a better distribution of labor and, if some what more expensive in amount required, being more evenly distributed, would, on many farms, be cheaper than the irregularity and inconvenience of gathering haying crews for short periods of service. The value of retaining the organic matter resulting from grain fed and forage produced upon this land and having it well distributed over the surface in the form of manure is an item of considerable importance in this district.

All that can be gained in buying grain in quantity is clear profit. In order that the greatest profit can be had from pasturing, grain (which is necessary for maximum returns) should be bought directly from the producer and in large quantities. Where a return of \$47.44 an acre was got for alfalfa pastured by feeding grain at \$30 a ton, a saving of \$37.68 would have been made by feeding grain at \$20 a ton, and an acre return of \$85.10 realized. From 1.5 to 2.5 pounds of grain should be fed daily for every 100 pounds of live weight. One and one-half pounds, or 1.5 per cent was fed in this experiment. For the comfort, protection and health of the animals substantial shelter should be afforded and the quarters kept clean and well disinfected. Fresh water and some form of mineral matter should be kept available at all times. A combination of soft coal, or charcoal, salt and a small amount of sulphur, kept in a small trough in the lot, is valuable to keep the animals in good thrifty condition. The grain should be fed twice a day and the animals frequently

changed from one plat of alfalfa to the other to keep them on succulent feed and get a maximum growth of forage. If not fed down closely, the alfalfa stubble should be clipped as soon each time as hogs are removed.

In a Hood River experiment this past summer, thirteen hogs, Duroc, averaging 73.5 pounds, made a total gain of 241 pounds in 32 days. This amounts to individual gain of 18.5 pounds and an average daily gain of .57 pounds per hog. This gain was made on clover pasture alone. For a thirty-day period on clover with .5 pound grain (rolled barley) per hog per day they gained 13.8 pounds per hog, or .44 pounds per day. During a 58-day period on the same clover and field peas which were mature, the same hogs made a total gain of 44.8 pounds, which amounted to a daily gain of .77 pounds. For a the period of 120 days these animals made a daily gain of .64 pounds, amounting to an individual gain of 77.2 pounds and a total gain for the period of 1,004 pounds. As the hogs were of excellent stuff for such an experiment they no doubt did well under the conditions, however they did not have sufficient grain to make maximum gains. With about 2 per cent of grain they should have made 1 pound gain a day. As they ran over three acres of clover and fed off four acres of peas in company with twenty head of smaller animals, it is impossible to determine what income they yielded per acre of clover, or of peas.

The question is sometimes asked, will not the hogs damage the trees? Yes, quite frequently they will injure young trees, and there are certain individuals that need watching or removing from the orchard. However, if there is an abundance of feed and good varieties, there is less danger. If the apples get heavy enough so as to bring the branches near the ground, hogs will often shake off large quantities of fruit. One should not try to over-class the orchard. The cull fruit is of questionable value. It is, however, worth something, but is poor for fattening.

It is exceedingly hard for an orchardist to engage in dairying on a large scale. There are a few exceptions, however. For example, a man who has abundant pasture and can raise plenty of feed, sell his milk at retail prices, and provide proper barns and pasture for his stock, will often make money. His herd, however, must be superior and he cannot afford to buy much of the food the cattle consumes. An orchardist can often make very good money on from one to three cows, and begin to lose money when he attempts more. The average cow which the dairyman offers the orchardist is of very questionable value. Very few men are temperamentally suited to handle both fruit and cows successfully.

A small flock of chickens should be found on every orchardist's ranch. It is only in exceptional cases, however, where large flocks of chickens will pay. If large numbers are kept, it

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A 3-year-old Stark Early Elberta Peach Tree—loaded with fruit. This photograph was taken by L. D. Hatchelor, State Horticulturist.

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requires much attention, and most orchardists feel that the element of grain is a factor which keeps them from going into the industry extensively.

I have felt that possibly it would pay some of our orchardists who have good crops of clover and alfalfa to attempt sheep fattening. There are sections of the Northwest where sheep can be secured in the spring of the year quite easily. There are other sections where people would be glad to lease pasture. We have tried an experiment with sheep this past year at Hood River, but hope to try it more extensively in the future. The report of this year's experiment is as follows: Eight head of ewes with lambs can be handled on three acres of good clover in orchards. The ewes made practically no gains, as they suckled the lambs throughout the determination. Our figures show that eight head

suckling lambs that averaged 26 pounds when put on clover with mothers (single lambs) made an average daily gain of 1.2 pounds each for a period of 52 days. No correction has here been made to cover gaunt condition of animals at first weighing, and full condition at final weight.

Where the fruitgrower has some pasturage, raising abundant hay and grain, it will generally pay him to raise his own colts, and sell off his work horses at the time they will bring the most money, and always break in new colts for his work. It is doubtful, however, if it will pay if one has not the feed and pasture.

The Province of British Columbia is holding packing schools throughout the various fruit districts during this winter for the purpose of instructing people who want to learn how to pack apples, so they will have an ample supply of packers for the year 1916, when they expect to produce a considerably larger crop than in any previous year.

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
Made Payable to

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

1916 Apple-Crop Estimates.—Every year there is agitation in the fruit world in the Northwest. In the winter of 1914 the agitation was all about the low prices obtained by the marketing concerns. The 1915 crop has brought the fruitgrowers good money, so they have now turned their attention to the 1916 apple crop. Many of them are busy in figuring what the crop may be. Mr. Corbalay of Spokane, Washington, sent out a number of letters to all the principal districts of the Northwest for the purpose of ascertaining the amount of bearing acreage and estimates on the yield for 1916. As a result of his investigation he gives two sets of figures for the tonnage on the apple crop in the year 1916—one minimum and the other maximum. Both were so large that many fruitgrowers have already been scared over the possible crop of 1916. The editor says "possible" advisedly. For many years the editor of "Better Fruit" has sent to the most reliable and conservative people in the Northwest, beginning early in the year, for the purpose of securing estimates for the coming season; at various times, beginning early in the winter, again at blossoming time and again after the fruit had set. The result of his observations are all worthy of consideration in connection with the estimates that are being given now for the 1916 crop. One district at this time of year has frequently reported as high as 7,000 or 8,000 cars on a conservative basis, but actually only shipping about 5,000 cars. Another district has estimated as high as 8,000 cars and in the same year shipped less than 3,000 cars. Another district has estimated 1,500 cars and not shipped over 200 cars. In 1912 one of the oldest selling agencies of the Northwest stated during

the blooming time that the crop of Hood River Valley would be 2,000 cars, adding "if the fruit set well." The editor of "Better Fruit" estimated the crop at about 1,200 cars, which was about correct for that year. In fact nearly every district in the Northwest has annually estimated the crop early in the season far in excess of the actual yield. The editor of "Better Fruit" has contended that no estimate should be given out at this time of year, or at blossom time. In fact estimates should not be given out until after the June drop is over. The editor has seen many orchards that in blossom looked like a snowbank that did not produce half a crop. The editor has seen many orchards with a splendid set of fruit before the June drop produce only 50 per cent of a crop. These bumper yields that everybody talks about have only come twice in the last twenty years—in the years 1896 and 1914. It is impossible to estimate a crop of apples with any degree of accuracy at this time of year. In fact it is impossible to estimate a crop with any degree of correctness until after the June drop. Even then it is impossible to estimate the crop of commercial apples that will be shipped, due to the fact that heavy losses may occur after that time from scab and from codling moth, which occurred last year, damaging 30 per cent of the crop of the Northwest, making it unfit for commercial purposes. There is no reason why fruitgrowers of the Northwest should cross a bridge before they get to it. There is no reason why they should be scared before they are hurt. On the other hand, there is every reason why every marketing organization should prepare for handling a probable or possible crop to the best of their ability in advance. The value of preparedness is thoroughly illustrated more forcefully by the war in Europe than by any other thing that has ever happened in the world. A man today can no more guess the apple crop of the United States, or of the Northwest, for 1916 than he can guess correctly when the present war will end. At the beginning of this war financiers of Wall Street, who are the ablest of the United States, closed the Stock Exchange on the ground that if it was kept open that Europe would unload United States securities on this country so rapidly that it would shake all values and drain the United States of gold. When the Stock Exchange opened, values remained at par, and instead of Europe draining the United States of gold, gold has continued to pour in from Europe, so that at the present time the United States has more gold than any other nation in the world. If the financiers of Wall Street are unable to predict any more correctly than this it does not look wise to give out estimates of so uncertain a thing as the apple crop this time of year, because we all know that when once big estimates are given out these impressions cannot be eradicated from the trade, and we all know that if the

impression exists that the crop will be heavy that it is the most demoralizing opinion that can exist in affecting values. So the editor of "Better Fruit" says go slow on giving out estimates of the crop of the Northwest until the apples are half grown and you know what you will have instead of guessing at it. No exception can be taken to figuring on probabilities and preparing ourselves to handle any possible crop that may be harvested in 1916, but mighty good judgment should be used about giving any figures on estimates at this time of year wide publicity.

Selling Organizations.—The Northwest has been passing through a great evolution in determining a marketing system adequate to handle the crops of the Northwest. After three years' experience it appears that no single organization has been able to control over 50 per cent of the tonnage. In nearly all of the different fruit districts there has existed for a number of years a number of selling concerns which, apparently, have established themselves so firmly that they have continued to hold about the same percentage of tonnage during the last few years as they held before any plan for one general marketing organization was undertaken. Inasmuch as the situation at the present time does not indicate that any of these marketing concerns will go out of existence, and for the further reason sufficient progress has not been made to indicate that in the near future any one marketing concern will control the entire Northwest, which is claimed by many would be ideal, but we will not argue this point. It seems that at the present time our policy should be, first, to prevent any increase in the number of marketing concerns. There is already enough competition. Second, we should support and maintain the present marketing organizations, particularly those which are giving the growers satisfaction. Third, that every fruitgrower should use his influence to persuade all fruitgrowers to go into one of the good existing marketing institutions, strengthening them in every way possible. It is the universal opinion of all men connected with existing marketing concerns that prices have been affected more seriously by irregular shipments, lack of orderly control and independent consignments of individuals who possess little or no knowledge of the markets to which they shipped, and in many cases who were entirely unacquainted with the house to whom they consigned.

"Influence of Supply on Prices" is the title of an article by Mr. A. U. Chaney, appearing elsewhere in this edition, which should be read by not only every man connected with the marketing and selling of fruits in the Northwest, but by every grower, for the reason it contains much important information and gives many valuable suggestions. Mr. Chaney is one of the big men engaged in marketing, having

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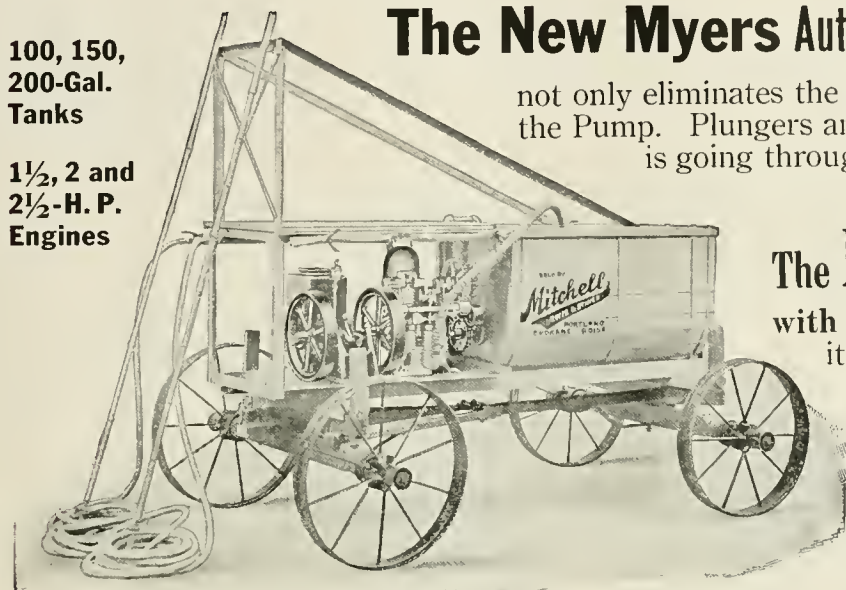
The New Myers Automatic Pressure Governor Pump


not only eliminates the Relief Valve but prolongs the life of the Pump. Plungers and Valves not in action unless spray is going through nozzles.

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P. O.

had many years' experience as a fruit broker and fruit dealer, and also in connection with the Cranberry Association, which business he has handled in a way that has commanded the admiration of all, having stabilized the cranberry industry and getting results for the grower that met with general approval and satisfaction. His comment upon the present system of distribution is well worthy of consideration. He calls attention to the fact that most retail dealers either visit the auction market or jobbers as frequently as they consider necessary in purchasing their supplies. In his opinion this system is inadequate, as it only takes care of the wants without accomplishing anything in the way of creating additional demand and consumption. Such a system is similar to the old system of a jobbing concern in mercantile lines many years ago when the retail dealers occasionally visited the jobber or manufacturer for the purpose of purchasing his supplies. This system of doing business has been replaced in the mercantile lines by salesmen who call on the trade at regular intervals. Mr. Chaney is of the opinion that every fruit jobber should have a sufficient number of salesmen to visit all of the retailers and dealers for the purpose of taking their orders, and at the same time telling the retailer what he has that is new in the way of fruits and what he has on the way. It seems that such a system would certainly be effective in increas-

ing sales and developing consumption in the fruit business, for the reason this system has been successful in all other mercantile lines. Mr. Chaney even goes further than this, believing that every retailer should have a sufficient number of salesmen to call on the consumer regularly, believing that by such combined effort the consumption of fruit could be immensely increased. It is impossible in a short editorial to bring out the valuable points and information, and it hardly seems necessary to treat the matter further editorially than to advise everyone connected with the fruit industry to read Mr. Chaney's able article.

December First Holdings.—The holdings for apples created some little surprise, but no great disturbance. While the amount on cold storage the first of December exceeded the amount on storage on the first of December, 1914, the information was taken quite philosophically, because everyone connected with the apple business realized trade this year is about 100 per cent better than it was last year. The general consensus of opinion on the part of handlers and consumers being that it is important to keep the apples going into consumption regularly every day, every week and every month until the present supply is exhausted before the season is over. This, of course, can only be done by making the prices sufficiently satisfactory to attract buyers and create consumption. Without

question the present holdings will go into consumption regularly, and it is believed and hoped that everyone will be able to sell at a price paying a fair profit, which is much better than holding the price so high that consumption will be arrested and a large quantity remain on cold storage late in the season, which always results in a heavy loss.

The Northwest Fruit Growers' Council.—Mr. W. H. Paulhamus, chairman, has just issued a very interesting circular informing the fruitgrowers that further action on the part of the Growers' Council has been deferred until the government officials, Messrs. Bassett, Moomaw and Kerr, render a statement giving the result of their investigation which they have been carrying on in reference to the fruit industry of the Northwest, which probably will be made public in the near future. Inasmuch as these gentlemen have already formulated a plan for the benefit of the fruitgrowers of the Northwest, which they will submit to the Federal Commission and the Office of Markets for approval. If it meets with approval, then these gentlemen will come back to the Pacific Northwest and acquaint all of us fruitgrowers fully with the plan and endeavor to help us in every way possible. The editor of "Better Fruit" had a long conference with Mr. Moomaw, therefore he feels justified in saying that he believes these

Continued on page 26

*We Now Present a
Marvel Motor in the*

Hudson

Super-Six

Patented by Hudson
December 28, 1915
Patent No. 1165861



Officially Breaking All Stock Car Records up to 100 Miles. Also All Stock Car Records for Quick Acceleration—Under A.A.A. Supervision

100 miles in 80 minutes, 21.4 seconds, averaging 74.67 miles per hour, with driver and passenger.

The previous best record of 72.49 was made by a car with more cylinders, more cylinder capacity and driver only.

75.69 miles in one hour with driver and passenger.

During this trial speed laps were made at 76.75 miles per hour. **70.74 miles in one hour, carrying 5 passengers, with top and windshield up**

The previous best record for stock car similarly equipped was made by a car with more cylinders, more cylinder capacity, and with only two passengers.

From standing start to 50 miles an hour in 16.2 seconds. This 7-passenger stock touring car was driven 1350 miles at speed exceeding 70 miles an hour without discoverable wear on any part.

All the above Hudson records were made with the same stock car, using the same motor, at Sheepshead Bay Speedway in November, under American Automobile Association supervision.

The most powerful motor per cubic inch displacement which the world has known.

Mark what these achievements mean.

No other stock car, in all the world's records, has done what this car has done.

This is not a mere new model with minor refinements, but an epoch-making car.

Even the rumor has for months kept Motordom on edge. But the wildest rumor was tame compared with truth. The Super-Six begins a revolution.

Note first that this change comes at the zenith of our success.

Only last fall a new-model Hudson won a new empire for us. It doubled our sales, and made a new record for fine cars.

We stopped that model in the height of demand, losing thousands of sales. We spent \$1,500,000 to again double production. We committed ourselves, on materials, etc., for \$42,000,000 worth of new-type cars. All because of what we now announce.

A GREATER HUDSON

On June 28, 1915, we applied for patent on the Super-Six. It was issued on December 28.

The claims we made were startling. They meant an almost twice-better Hudson. They meant reduced vibration in seemingly impossible degree.

They meant an increase of 50 per cent in possible motor speed. They meant an addition of 80 per cent to our power, without added size or cylinders.

They would give a new meaning to flexibility, silence and ease of control. It was clear that such a motor was bound to supersede the best types in existence.

CLAIMS PROVED TRUE

Those claims were based on shop tests. Now, after months of road tests, we pronounce them true.

We compared the Super-Six with our old Six, with results told on next page.

We built and bought Eights to compare with it. Then we built and bought V-type Twelves. We were, by the way, among the first to test out these types in cars.

We convinced ourselves in a hundred ways that this new motor would dominate the field. Then we abandoned forever the old-type Six, and all idea of an Eight or Twelve.

ALSO A SUPER-CAR

In the months between every detail of the car has been raised to this motor standard.

We designed a new body with larger room and with perfect flowing lines. We built it with the double cowl—in two compartments, each with a rounded dash. The finest grain leather is employed in the upholstery. The new windshield is slanted. There are disappearing seats in the tonneau.

We called in famous coach builders, experts and artists. And we gave them free hand to reach luxury's limit in the bodies for the Super-Six.

You will see that they did it. There's no need to argue that. A single glance at this new car will impress its superb distinction.

Hudson Power Increased 80%

To 76 Horsepower—Without Added Size or Cylinders

Three years ago, when Hudson engineers brought out the Light Six, it was welcomed as the ideal car.

A smaller bore and longer stroke lightened engine parts immensely. That lightness reduced vibration. The engine was a marvel for high speed, economy, flexibility and power.

That motor very quickly drove heavy sixes out. It became the pattern type. In two years it multiplied Hudson prestige and quadrupled Hudson production.

BETTERED 80 PER CENT

Let us compare that Hudson Six-40 with the present Super-Six.

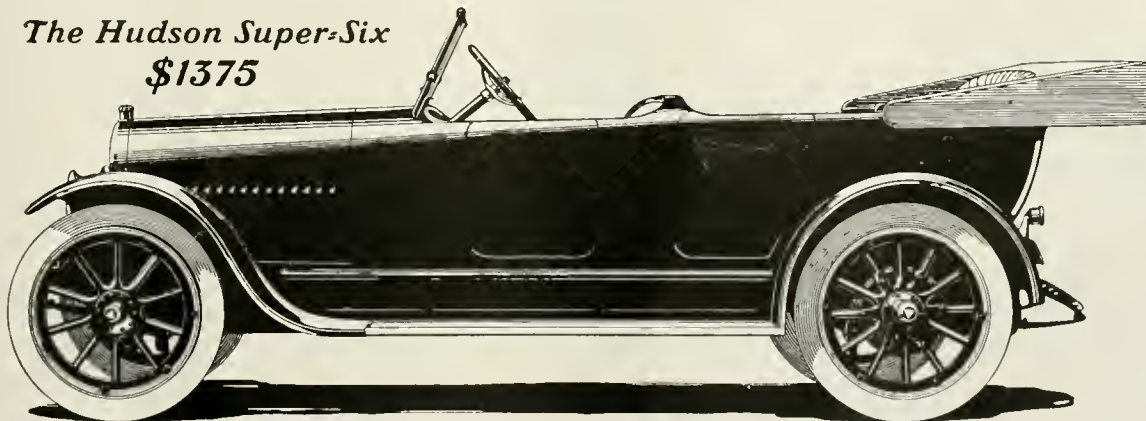
That motor speed capacity is now increased 50 per cent.

The Six-40, at high speed, delivered 42 horsepower. *The Super-Six delivers 76 horsepower.*

Yet both engines are Sixes. The cylinder size is identical. No extra cylinders, size or complications. That increase in horsepower of 80 per cent shows the saving in vibration.

The Six-40 has made 55 miles per hour. The Super-Six covered 100 miles at an average speed of 74.67 miles per hour—a 7-passenger stock car, under American Automobile Association supervision. That breaks every record on stock cars, with engines of any type. It also has broken all official records in quick acceleration.

The Hudson Super-Six \$1375



Hudson Super-Six with 7-Passenger Phaeton Body—\$1375 f.o.b. Detroit. Also Built as a Roadster, a Cabriolet, a Touring Sedan, a Limousine and a Town Car.

Mark those comparisons. And remember that the Hudson Six-40 was the leading high-grade Six.

THE MEANING OF SPEED

A motor car engine is measured by its possible high speed. That signifies lack of vibration. And swift revolution is the only way to high power combined with lightness and flexibility.

High speed in a motor means vast reserve power. It means ability to creep on high gear, to pick up quickly, to mount hills without effort, to avoid changing gears, to pull readily out of difficult spots.

All that pertains to luxury of motion depends on a high-speed vibrationless motor. That is what is accomplished in the Super-Six in a degree heretofore unknown.

A block's ride in this car will prove it. Severe tests will lead you to marvel. Comparison with any car of any type will wipe out any question of this new car's supremacy. It is too vast to dispute.

MORE FINE CARS NOW

This Super-Six will appeal to fine-car buyers. We believe, too, it will multiply their numbers.

The price, despite this luxury, is but \$1375. That's because we shall build this season 42 million dollars' worth.

Many a man who thinks of \$1000 will pay the difference for the Super-Six. And he will save it in engine wear and fuel.

The Super-Six is resistless. Its distinction, its beauty, its feel, its power, speed and flexibility will delight every motor car lover. The man who gets it will have all that any man can get.

Hudson Dealers Have It Now on Show
Ask for the Super-Six Catalog—Just Out

HUDSON MOTOR CAR COMPANY
Detroit, Mich.

Continued from page 23

gentlemen have accomplished a great work for the fruitgrowers of the Northwest, and it is his firm opinion they will submit a plan that will be exceedingly helpful, not only to all fruitgrowers but to all the marketing concerns, in handling the coming fruit crops of the Northwest.

Codling Moth.—The very instructive research work done by Professor T. O. Morrison, horticulturist for the State of Washington, showing the loss from codling moth to be about 30 per cent for the year 1915, which appeared in the January edition of "Better Fruit," should be read by every fruitgrower, because it is certainly very convincing evidence that freedom from worms can only be secured by proper syringing material and proper spraying methods. The loss from codling moth last year was so extensive that it ought to be evident to the fruitgrowers that thorough spraying and good materials from reliable manufacturers are absolutely necessary. While it is true the fruitgrower can occasionally omit some spray without serious loss, he cannot afford to take chance; therefore a good thing for the fruitgrower to do who wants a clean crop is to get recommendation of the Experiment Station or follow his own methods if they have been tried out and proved successful over a number of years, and follow the program throughout the season.

Tying Fruit Trees.—Most fruitgrowers postpone the tying of fruit trees until late in the summer when the crop is set and the limbs bent down with the weight of fruit, when the operation is very difficult. It is very difficult to tie the limbs late in the year without knocking off more or less fruit, therefore it is the opinion of the editor, founded on experience, that the interior framework of the tree should be tied during the latter part of the winter and spring, before the blossoming period, for the reason that the work can then be done without knocking off the fruit and much more easily than it can be done later in the year when the tree is dense with foliage. Such an initial tying of the framework seems advisable this time of year. Later in the year the fruitgrower could tie up the smaller branches and exterior branches in such a way as may be necessary on account of the crop being heavy.

Lack of Spray Materials.—Many handlers of sprays, associations, selling concerns and mercantile houses, owing to the business depression and tightness of money, bought too conservatively last year, not laying in a sufficient quantity of many of the necessary spray materials for the different diseases and pests, consequently a great many fruitgrowers were unable to obtain just what they wanted in the way of spray material and either were compelled to go without spraying or use a substitute.

Planet Jr. Orchard Cultivator

—the fruit grower's greatest ally

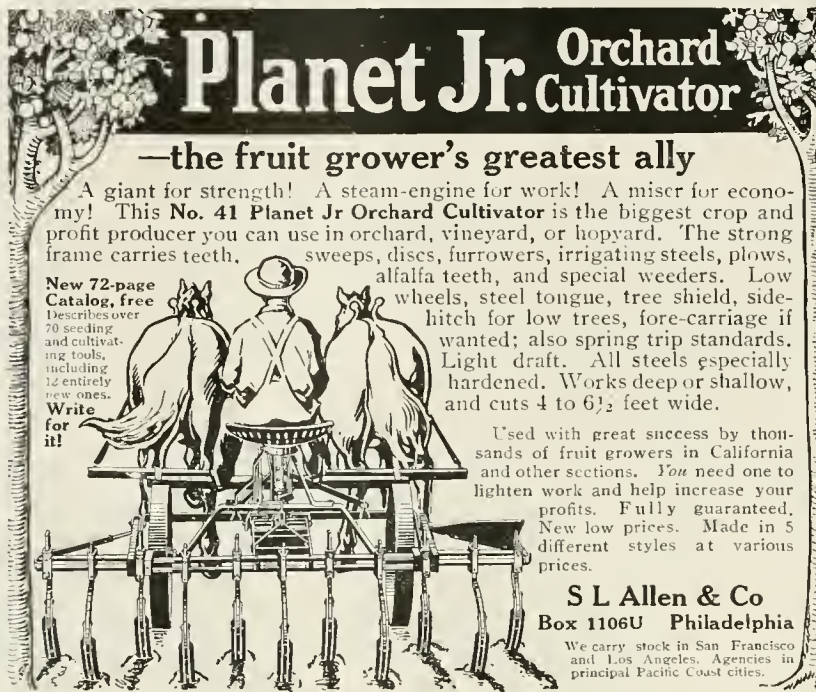
A giant for strength! A steam-engine for work! A miser for economy! This No. 41 Planet Jr Orchard Cultivator is the biggest crop and profit producer you can use in orchard, vineyard, or hopyard. The strong frame carries teeth, sweeps, discs, furrowers, irrigating steels, plows, alfalfa teeth, and special weeders. Low wheels, steel tongue, tree shield, side-hitch for low trees, fore-carriage if wanted; also spring trip standards. Light draft. All steels especially hardened. Works deep or shallow, and cuts 4 to 6½ feet wide.

Used with great success by thousands of fruit growers in California and other sections. You need one to lighten work and help increase your profits. Fully guaranteed. New low prices. Made in 5 different styles at various prices.

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Describes over 70 seeding and cultivating tools, including 12 entirely new ones. Write for it!



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comes from trees that have sufficient plant food—plant food they take from the soil—soil that is yearly replenished with the elements necessary if the trees are to have a steady growth and bear fruit in quantity and quality.

BEAVER BRAND ANIMAL FERTILIZER

"A Fertilizer for Every Soil"

puts back into the soil the plant food your fruit trees must have to make them sturdy and healthy. Beaver Brand Animal Fertilizer is no experiment. It is vouched for by many fruit growers who have larger and better yields from its use.

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The Alpha Automatic Power Spray Outfit

(PATENTED)

Fitted with 2-inch or 2½-inch Automatic Duplex or Triplex Pump.—Equipped with the New Mechanical

Automatic Pressure Governor

Which Insures Safety, Secures Uniform Pressure and Eliminates Unnecessary Wear.—No Relief or Diaphragm Valve Required.—Top Guard Rails Fold Up or Can Be Quickly Removed.—Gear or Belt Driven.—Brass Fitted Throughout.

THE TWO ESSENTIALS in a power sprayer are a thoroughly dependable engine of ample horsepower and a positive and reliable pressure regulator that will insure uniform pressure and eliminate unnecessary wear.

THE AVERAGE SPRAY RIG is equipped with a cheap engine and a makeshift pressure relief valve or diaphragm, which is exposed to the corrosive action of the spray material, which soon puts it out of commission.

THE ALPHA AUTOMATIC PRESSURE GOVERNOR with which the Alpha Spray Outfit is equipped is a simple arrangement of a combined lever and spring on each plunger connecting rod which, when the pressure reaches a pre-determined limit, automatically discontinues the operation of the pump without interrupting the driving power, again permitting it to resume operation when the pressure falls below the point at which it has been set.

THIS INSURES SAFETY, secures uniform pressure, and eliminates unnecessary wear (no liquid pumped except it passes through the nozzles), the pressure relief is not dependent on the operation of a sluggish or defective relief valve, but is positive and mechanical, thus making it impossible to run the pressure up to the danger point.

THE POWER PLANT, depending on the size rig, is either a 2½-h.p. or a 3½-h.p. Alpha Engine, equipped with a "built-in," gear-driven, positively-timed magneto, requiring no batteries or coil, and is easily started on the magneto without cranking.



CAN YOU AFFORD to own a spray outfit that will balk? When you get ready to spray you have no time to tinker with a defective engine, pump or relief valve, but want an outfit that is capable of a continued high pressure maintenance and one that is thoroughly dependable in every particular.

THE ALPHA AUTOMATIC SPRAY OUTFIT will meet your most exacting demands. The entire framework is made of channel and angle iron, fitted with a wrought steel bedplate on which the engine and pump are mounted, direct connected with machine-cut steel gears.

BUILT IN ALL SIZES from a 2-inch pump and a 100-gallon tank to a 2½x3-inch pump and a 200-gallon tank. (Either duplex or triplex.)

IT WILL PAY YOU to investigate thoroughly the merits of the Alpha Automatic Power Sprayer before buying. Send for catalog and prices.

De Laval Dairy Supply Co.

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Everything for the Dairy

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Please mail your Catalog C-2 describing your Alpha Sprayer Outfit to—

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"Fruit Marketing of the Pacific Northwest" is the title of an article by Mr. H. F. Davidson, which is well worthy of the attention of everyone connected with the fruit industry, for the reason Mr. Davidson has been engaged as a fruitgrower and as a marketer of fruits in the Northwest for about thirty years, probably having had a larger and more general experience in the marketing of fruits than any other man in the Northwestern territory. In this article Mr. Davidson brings out very effectively the value of co-operation and orderly control as essential in the marketing if the fruit of the Northwest is to be marketed to the best advantage. Mr. Davidson recognizes the fact that there are many marketing concerns in the Northwest in the different districts that have been engaged in the business for years which for various reasons, as shown in his article, have controlled a large tonnage in their respective districts, and further expresses the opinion that these same concerns will continue to control a large volume of tonnage in the different districts of the Northwest. Therefore, if the fruit of the Northwest is to be marketed at a figure that will pay the grower a satisfactory profit on the investment, it is Mr. Davidson's conclusion that these marketing concerns must get together and work out a practical plan not only for the mutual protection of themselves, but a plan that will pay the fruitgrower at the same time a satisfactory profit. Without a

satisfactory profit the fruitgrowers of the Northwest cannot continue to exist, and if they go out of business there will be no business for the marketing concerns. Mr. Davidson believes it can be done. He also believes that every business man and every bank of the Northwest whose business in any way depends upon the fruit industry should assist in this work in every way possible.

Fire Blight.—It will not be long before fire blight will begin its work, therefore it seems timely to suggest to the fruitgrowers, at least to those who are not posted, that they take advantage of the present time when they are not busy to learn and ascertain the proper methods for control in order to fight fire blight when it begins to show up, because only by drastic work can fire blight either be controlled or eliminated.

The Southern Pacific Railway is doing some very valuable work in a way that certainly will be very effective in inducing travel to the Northwest with a view to assisting in upbuilding the Northwest. The Southern Pacific Railway is sending to passenger agents of the various roads throughout the United States very interesting and instructive letters about the scenery along the Overland Routes from Chicago to the Pacific Northwest, and also along the line of the Southern Pacific from Portland to San Francisco. Such information will enable the ticket agent to intelligently set forth the attractions of the Northwest in such manner as to induce many people to visit the Northwest. In connection with this work Mr. John M. Scott, General Passenger Agent of the Southern Pacific Railway, states that the Southern Pacific has issued

some very attractive folders describing the cities, towns and points of interest on the Southern Pacific line from Portland to New Orleans and from San Francisco to Ogden. They are called the "Wayside Notes Shasta Route," the "Wayside Notes Sunset Route," and "Wayside Notes Ogden Route." These booklets can be obtained by request from one of the passenger agents of this road. They are beautifully illustrated and will no doubt be good features in showing up the scenery along the Overland Routes, particularly the Pacific Coast.

Cold Weather Freezes Apples.—The very cold spell covering the entire Northwest when nearly every fruit section went to zero, and some sections considerably lower, caught a large quantity of apples on common storage, causing a very heavy loss.

Frost Damage Prevented

BOLTON ORCHARD HEATERS

29c each

Two-Gallon Capacity

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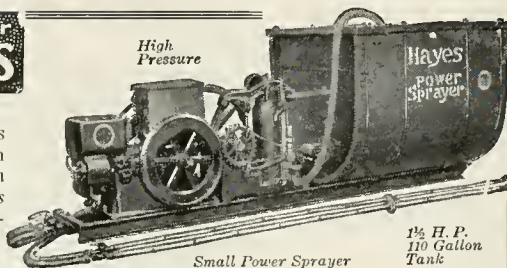
San Francisco, Cal.

Hayes Hand & Power SPRAYERS

HIGH-PRESSURE Spraying is plus spraying—it is 100% efficient. High Pressure completely atomizes the solution into a penetrating, fog-like mist that *seeks out and adheres* to every particle of foliage. It reaches protected pests that lurk in the innermost crevices of the bark, under bud scales and beneath the stamens of apple blossoms, and easily controls those on the outside surface. Mere “sprinkling” at low pressure will not give practical control.

Not only does High-Pressure Spraying insure a better quality of fruit but requires less solution, less time to apply, hence lessened cost. A High-Pressure Power Sprayer will pay you bigger dividends than any other orchard investment you can make.

HAYES Power Sprayers are tested to 500 lbs. and are *guaranteed* to develop 300 lbs. working pressure. They are built for con-



stant operation at high pressure and enduring service. This not only requires the most thorough mechanical construction but the highest grade materials, hose and fittings.

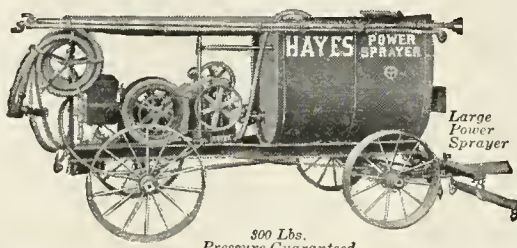
50 STYLES Large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, disinfecting, painting, farm, home and garden use. Complete outfits or separate spray pumps, hose, nozzles, fittings, bamboo rods, etc.

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50 STYLES
Hand or Power
Sprayers for
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Orchards.



Fruit Marketing of the Pacific Northwest

By H. F. Davidson, Hood River, Oregon.

MARKETING the 1915 Northwestern boxed apple crop is largely a matter of history. Prices have not been good, and growers will have been good and growers will have money of their own as profits to put in the banks to their credit. The crop has been sold down to practically two varieties, Newtown Pippins and Wine-saps, both late-keeping spring apples, and at least fifty per cent of these two varieties have been disposed of. When the Northwestern growers receive a fair price for their apples, on a fair yield, they make money, and the 1915 crop is bringing them a nice profit for the Extra Fancy and Fancy grades.

In each of the large fruit-growing districts of the four Northwestern States—Oregon, Washington, Idaho and Montana—many substantial local marketing firms have grown up with the orchards and have interwoven their affairs with those of the communities in which they operate by establishing personal friendships and confidence, and by using their financial credit to assist growers who are not financially able to grow and harvest their crops unaided; which in some cases is more or less of a continuous proposition from year to year, and in this way these packing and shipping concerns have established themselves and kept themselves established in their re-

spective localities to the extent of controlling the marketing of a large percentage of the fruit crop of these four states.

Theoretically, the big marketing organizations which have been formed to handle the large tonnage are about ideal, but to a large extent these big organizations have been handled and managed by men who did not have the confidence and support of the local shippers, with the result that no organization up to the present time has been able to control a sufficient percentage of the tonnage to maintain sufficient control over the distribution whereby it could obtain what appeared to the growers to be maximum results. The men who are managing these big marketing organizations are men of the very highest type; have the confidence of the growers and bankers generally, but they have the competition of the local shippers whose personal acquaintance and knowledge of local conditions, added to their ability to extend credit to local growers, has divided the control of the tonnage to the extent that the large organizations have not enjoyed the opportunity to test the theory of centralized distribution and selling with proper control of the tonnage.

It was demonstrated in 1913 that on a short crop year, when the demand ex-

ceeded the supply at highly remunerative prices to the grower, that a large organization with only a fifty per cent control could distribute and market that part of the tonnage in a manner that materially strengthened the marketing situation, and for the first time in the history of the Northwestern fruit industry, since it assumed any considerable volume, prices actually advanced and the advances were maintained during the heavy part of the marketing season.

It was just as clearly demonstrated in 1914, with considerably larger crops and with markets curtailed by depressed financial conditions and the European war, and when there was really a surplus above the actual demand at profitable prices to the growers, that the organizations could not maintain any substantial influence in the markets with but fifty per cent of the tonnage under control.

It is freely admitted in the Northwest that there are orchards enough now growing to produce a big surplus of fruit above what can be marketed at a profit to the growers. Under the hap-hazard hit-and-miss conditions which must of necessity exist when a number of small shippers are working independently of each other in each of the producing districts and it must be determined within a short time whether the future crops will be marketed in a systematic way or whether the deal will be along the “starve-out” route and the survival of the fittest result in the elimination of too big a percentage of orchardists and present fruit acreage. At the moment, Hood River is the only district which has practically no competition within its own district. This district has an organization which is marketing a very large percentage of its product, and the result of this season's operations will enable the growers of that district to determine whether or not this plan is successful. The Hood River crop this season happens to be largely of export varieties, which is a serious handicap under the strenuous European war conditions, but good headway is being made by personal representation in Europe and that portion of the crop suitable for domestic markets is well high marketed, with extremely satisfactory results.

The fruitgrowers of the Northwest find it difficult to get together on any practical and efficient lines. When a grower located in Hood River he did so because he knew it was the best fruit district in the world, and was soon taught that all the other districts might be forced out of business while the natural advantages of his district in producing big yields of fruit of so much finer quality that any of the other districts could produce would enable him to make a profit when the growers in the other districts were forced to make losses and discontinue the business. This same line of argument has applied to the growers who located in each of the big districts and has not left the growers of Southern Oregon, for instance, in a frame of

mind to feel the necessity or propriety of co-operating seriously with the growers of Wenatchee or Southern Idaho, and this same thought applies to many growers in all of the prominent sections.

Experience shows that there is another class of gentlemen, who are fewer in number, most of whom see the handwriting on the wall, and it appears to be up to these gentlemen, the shippers, to work out a practical plan for the mutual protection of themselves and the growers that will preserve the fruit industry of the Northwest on a basis that will be profitable to the growers as well as themselves. To the shippers must be added the influence and advice of another class of gentlemen in the Northwest who are becoming vitally interested in the proposition, and who will become more interested if the unpaid notes become musty, and they are the bankers, the gentlemen who must finance the growing and harvesting of the crops if enough revenue is to be produced to enable the note makers—the growers—to pay up.

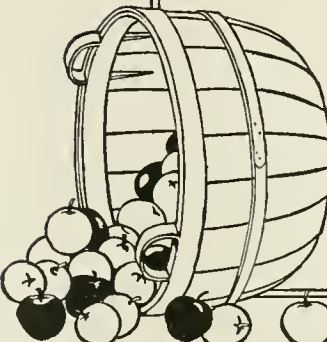
The question before the house is, Will enough men out of the large number of practical shippers and practical bankers get together and give this matter sufficient attention to work out the proper solution. The proposition is not seriously complicated from this angle, but it will require an honest, energetic, intelligent effort on the part of a number of loyal gentlemen to solve the problem. The intelligence is easily available. Enough experimenting has been done and enough experience has been gained to reduce the task largely to that of energy and effort to bring the fruit industry of the Northwest from a condition of chaotic disappointment to one of satisfaction and profit to growers, shippers and bankers and merchants. The industry is estimated to represent an investment of over \$200,000,000, and while a very large percentage of this investment has not reached the full-bearing age, yet it should produce an income of from \$15,000,000 to \$20,000,000 in 1916 and should show a gradual increase from year to year.

A Good Word for Apple Diet.—Mrs. J. H. Kline wrote a short article, which appeared in the San Francisco Chronicle, stating that she is the matron of a boys' home and has found by experience and observation that the kinds of food that the boys eat are serious factors in their dispositions. The most interesting observation to the fruitgrower in connection with her studies is that she notices that a liberal supply of apples mixed with their diet acts wonderfully for their betterment, observing also that chemists have never been able to produce anything that acts so well on the liver as apple juice, not the pressed-out juice or cider, but the juice chewed out of an apple by the teeth; and what is equally important in the way of increasing consumption is her statement "that no boy ever refuses an apple."

British Columbia Apples for San Diego Exposition.—The San Diego Exposition is to be continued for another year. It is interesting in connection with this statement to know that the Department of Agriculture of the Dominion Government, Ottawa, in appreciation of the value of this splendid opportunity for publicity, have instructed the Province of British Columbia to prepare and ship 1,000 boxes for exhibition.

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Timely spraying is an investment, not an expense. Sherwin-Williams Dry-Powdered Insecticides and Fungicides pay big dividends at harvest time. Sure death to pests. Can't injure foliage. Easy to ship, store and handle without danger of freezing or drying out.



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From a farm hand at \$25 a month to a tree expert at \$3,000 a year—from monotonous grind to a fascinating, healthful, respected profession—that is the rise of the man pictured here, P. E. Hudson, Jamaica, L. I., N. Y. Through the Davey course of training by mail hundreds of young men, like Hudson, have improved their condition in life. You have an equal chance. A few months study, at home, in your spare time, will fit you for any of the following positions — Tree Surgery, City Forestry, Park Superintendent, Fruit Growing, Tree Surgery and Fruit Growing, City Tree Expert, Forestry. These fields are uncrowded; you will have more demands for your services than you can fill. Write today for book, "Adventures in Success," and tell us which of the professions listed above especially appeals to you.

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J. B. PILKINGTON, Nurseryman, Portland, Ore.

Apple Exports.—Up to about the first of January the apple exports have been light compared with last year, the quantity already exported only being about one-half of what was exported up to the same time in the year 1911. The falling off of the export trade is due principally to the fact that it is difficult to obtain space on freight steamers, and also to the fact that the rates are so exceedingly high.

the Office of Markets and Rural Organization, United States Department of Agriculture, on "Cold Storage," there was on cold storage December 1, 1915, 4,206,825 barrels of apples, showing an increase over last year. Figures for December 1, 1914, were 3,231,829 barrels. The situation is reversed in the box business, 1915 showing 3,375,997 boxes, against 4,147,506 boxes December 1, 1914, a reduction of 771,509 boxes.

Oregon Hens.—The final reports of the official records made by the Oregon Agricultural Club hens at the Panama Exposition show that while the White Leghorns won by a handsome margin over all competitors, the other two college pens, the Oregon and Barred

Rocks, tied for second place over all other competitors. The pen of Leghorns laid 1,616 eggs during the year; the other two pens referred to 1,407 eggs each.

The Consolidating of Two Fruit Districts.—Underwood and White Salmon districts are working to combine the two existing organizations under one head, which seems a step in the right direction, as the kind and quality of fruit produced in both districts are the same.

White Salmon Apples Win First Prizes in New York.—The State College of Agriculture, according to the White Salmon Enterprise, White Salmon was awarded first prizes on the following varieties: Hydes King, Ortleby, Winter Banana and Gravenstein.

Death of Mr. W. B. Glatke.—All fruitgrowers will learn with much regret of the death of W. B. Glatke, who has long been identified with the fruit industry as one of the leading commission merchants of Portland, where he was in business for the past thirty years. Mr. Glatke was one of the best-liked men on the street, and known for his kind heartedness and generous way of dealing.

Lime Sulphur Lead Arsenate Bordeaux Paste Spra-Sulphur

The most serious pests and diseases doing the most damage to trees in the Northwest are San Jose Scale and Anthracnose. The ones doing the most damage to crops and causing a loss of millions annually to fruit growers, are Codling Moth and Scab.

Growers Must Have Sprays that are Efficient

We make the above sprays of the highest degree of efficiency and sell at reasonable prices.

Clean crops are necessary if you expect to sell your apples at good prices.

Use Our Sprays and Grow Clean Fruit

Factory at Clackamas, Oregon.
New factory being built at Hood River, Oregon.

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The History of Axle Grease

While lubricants have been used on axles ever since the first pair of wheels was carved out of wood, the axle grease of the present day is of comparatively recent manufacture. Probably the first lubricant of any kind to be used on axles was pure animal fat—quite similar in every respect to the grease the housewife of today uses in greasing her pans. This met the requirements of that day and generation—and indeed, it is still used in some parts of the world. We need go no further than Cuba, or Central America, where the big clumsy wooden-wheeled, ox-drawn carts are still in vogue. Each carreta (as they are called) carries a bottle of grease tied to the axle, so it will be handy when needed. Owing to the poor lubricating qualities of this tallow, the axles must be greased frequently. What a contrast between this and our present-day methods!

Various kinds of oils have been used for axle lubrication, but for the reasons that they were too expensive, not heavy enough, etc., they have been discarded, notably castor oil, which is now prohibitive in price. The ideal axle grease must embody these points—a good lubricant—must not contain acids that will injure the axle—must be durable—of sufficient consistency to withstand the summer heat—and in wet and stormy weather during the winter, axle grease must be sufficiently adhesive (without being gummy) so that the water will not wash it from the axles. Flake graphite added in the manufacture to Regular Amber-Colored Axle Grease makes a combination which is particularly fitted to overcome moisture, and that is why a graphite axle grease is recommended during the winter months. The labor-saving American public is willing to pay for anything that will, in the end, save them time or money. Although there are many cheap grades of axle grease on the market, the best brands, which cost a trifle more, are the only kind that have given satisfaction. Sensible purchasers throughout the world realize that quality means more than price, and that cheap greases cost more in the end. For that reason, sales of high-grade axle greases are increasing every year.

Winter Injury of Fruit Trees

The extremely cold weather of the early part of this month (January, 1916) will probably do harm to many tender fruit trees and shrubs. The most severe cases will result in killing back the young wood and splitting the trunks and large branches of the trees; the young branches turn brown or black throughout and usually wither slightly. In the larger branches and trunk the inner bark, or the cambium layer, and part of the sap wood may turn brown, the bark often splits in a perpendicular line and curls back. The wood of the trunk may split in extreme cases. The bark is sometimes killed

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founded on a Quarter Century of SQUARE DEALING



164 PAGES

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PORTLAND SEED Co.
PORTLAND, OREGON

The winter injury that is most liable to kill the tree is that form in which the trunk is girdled. This can be bridge grafted and the tree saved with only slightly checking its growth. The pruning away of injured parts should be done as soon as possible after the harm has been done. The bridge grafting should be done just before rapid growth starts in the spring. This process is described in Popular Bulletin No. 67 of the Experiment Station.—Washington State Experiment Station Bulletin.

Good Roads.—It is stated that 1,000 miles of perfect roadway have been constructed by the prisoners of the penitentiary of Colorado. This work was first done under armed guards, but later the honor system was introduced and is still in vogue. Colorado's plan was successful in securing good roads at a very low cost of production. Good roads are essential to the upbuilding of every community and are a necessity for economy in transportation for every farmer. The automobiles have done more to bring about good roads than any other industry of the United States. Automobiles have made good roads popular, and good roads in turn are making the automobile popular. Originally automobiles were principally used for pleasure, but now they are becoming a business necessity. With good roads and automobiles there will be much more traveling, and the combination presents an opportunity for sight-seeing, pleasure, health and increased business. Nothing would be more successful in bringing settlers to the Pacific Coast than a good overland automobile road between the Atlantic and Pacific Oceans. Iowa has long been celebrated for good roads, the result being a passenger automobile to every fifteen people. In Kansas many of the blacksmith shops are being converted into garages. There are over 73,000 automobiles in Kansas. New Jersey is another state where good roads has increased prosperity. Although only a small state it contains 79,300 passenger cars and 11,000 motor trucks, paying annual license fees of \$1,155,000. California, the state noted for good roads and delightful weather for traveling the year round, has 160,000 automobiles. The good-road movement in Oregon and Washington has resulted in improvement on all roads. The completion of the Columbia Highway between Portland and Hood River is the most wonderful achievement of road building in the United States in every particular. The scenery along the Columbia River, which the Columbia Highway parallels, is unequalled in any similar mileage in the United States. Those who have traveled all over the world are frank to admit that this piece of roadway has the most wonderful scenery of any roadway of similar length anywhere in the world.

The Shippers' League Defers Completing Organization.—The movement on foot to incorporate a Shippers' League has been deferred until a report shall be rendered by the government officials who have been engaged in studying marketing conditions in the Northwest. The last session was held in North Yakima in the middle of December. The following resolutions were adopted, which will be of interest to the fruitgrowers, indicating a strong desire on the part of all selling concerns to co-operate with any plan for the betterment of marketing conditions that may be suggested by the government officials now engaged in formulating a plan for the improvement of the fruit industry of the Northwest: "Whereas, the present fruit marketing situation can be met only by growers and shippers working intelligently together to bring all the tonnage under orderly control that will prevent demoralization of markets and will make possible the expansion of markets to provide an outlet for the increasing quantity of fruit; and whereas, there exists an opportunity to secure co-operation of the Federal Trade Commission and the U. S. Office of Markets in making a complete survey and recommendation on this situation; and whereas, united action of the strong shipping factors of the Northwest is necessary to secure this federal co-operation; and whereas, we believe that generally concerted action of these same shippers can greatly increase the outlet and distribution of our Northwestern fruits; therefore be it resolved by the members of the Northwest Fruit Shippers' Council: That we

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Healdsburg, California

entirely around the trunk at or just above the surface of the soil or snow.

In handling such injuries, Professor O. M. Morris, horticulturist of the Washington Agricultural Experiment Station at Pullman, advises that the winter-killed twigs should be cut back to sound or live wood. Sometimes the sap wood is injured and turns brown, but is not killed. If cutting away all such injured wood necessitates extremely severe pruning it should not be done. However, all wood on which the bark is killed should be pruned away. The split bark on the trunk and larger limbs should be prevented from curling back by banding or by the use of tacks and small nails. If the bark is killed back from the edge of the split an inch or more on each side this should be covered by bridge grafting.

pledge ourselves to united action and to give our united assistance in helping the work of the representatives of the government; and that we express our earnest determination to work together and to incorporate a permanent non-profit-sharing corporation to develop methods and ways and means of meeting the existing situation by working out a plan of marketing and of market extension that will enable us to sell the box-apple crop of 1916 and succeeding years at prices that will be profitable to the grower." The following interests were represented at the meeting: J. H. Robbins of Spokane, F. E. Sicks of the North Pacific Fruit Distributors; W. F. Gwin and Worrall Wilson of Seattle, the Northwestern Fruit Exchange; L. J. Blot of Spokane, the Spokane Fruit Growers' Association; Wilmer Seig of Hood River, the Hood River Apple

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WORKS AND LABORATORY, HOBOKEN, N. J.

Growers' Union; Conrad Rose of Wenatchee, the Wenatchee Produce Company; H. M. Gilbert, the Richey-Gilbert Company; Fred Eberle, the Horticultural Union, and Clyde McKee the Thompson Fruit Company. The government officials are C. E. Bassett, W. H. Kerr, C. W. Moomaw and J. C. Gilbert, all from Washington, D. C., and representing the office of Markets and Rural Organization. The apple growers of the Northwest were represented at the meeting by W. H. Paulhamus, chairman of the board of trustees of the Growers' Council, and Gordon C. Corbalay of Spokane.

Big Estimates.—In these days of big estimates and scares over the immense big apple crop that the Northwest may have in 1916, it is interesting to note the observations of the Daily World, published in Wenatchee, which appear in an Eastern trade paper, briefly as follows: "When everybody in Wenatchee district was mad five or six years ago, Wenatchee was credited for the year 1915 with 12,000 cars of apples. The actual production for 1915 was 1,000 cars." The World calls attention to the fact that estimators overlooked the fact in calculating that there are many adverse conditions that interfere with the tonnage calculations on paper, mentioning a few like blight, worms, lack of water, winter kill and various other pests, and wisely comments in conclusion that the stories of enormous production always hurt the market. While it is a good thing to have the marketing agencies organized so they can take care of the maximum production, yet such stories as went the rounds of the public press have an unfavorable influence on the market. This is very much in line with the idea as expressed by the editor through the columns of "Better Fruit" frequently during many years in the

past, who again desires to call attention to the fact that in Spokane a few years ago the crop for 1915 was estimated by one of the railway officials at 50,000 cars for the Northwest, whereas the 1915 crop when harvested was approximately 10,000 cars, maybe less.

Warning to Fruitgrowers.—Mr. Luke Powell, District Horticultural Inspector, Prosser, Washington, has issued a letter of warning to the fruitgrowers. Lack of space in this issue, much to our regret, prevents publication in full, but briefly the main features of the warning are covered in the following condensed statement: "Beware of any mysterious, marvelous and secret remedies that are offered for sale for the control of any pests, diseases or troubles of the orchardist. It is quite common on the part of such manufacturers to state that the secret compounds are the result of many years of study, but that perfection has been achieved." In Mr. Powell's letter of warning to the fruitgrowers, an extract is made from Circular No. 141 of the Agricultural Experiment Station of California, which gives some very interesting information in reference to the Experiment Station examinations of various remedies that are offered for sale. Mr. Powell advises fruitgrowers not to try any unknown remedies and he presents very valuable suggestions in advising fruitgrowers, where they have troubles, diseases or pests, which they do not know how to control, to consult the United States Department of Agriculture, the Experiment Stations in their respective states and the various horticultural departments. The government man and the Experiment Station man receives his pay from the state or government. He is competent, and therefore his recommendations are always valuable and are also free from commercialism.

The Shippers' League makes the following announcement of committees:

Export Markets—W. F. Gwin of the Northwestern Fruit Exchange, J. H. Robbins of the North Pacific Fruit Distributors, Wilmer Seig of the Hood River Apple Growers' Union, Conrad Rose of the Wenatchee Produce Co. and H. M. Gilbert of the Richey & Gilbert Co.
Eastern Markets—G. C. Corbalay of Spokane, W. F. Gwin, Walter Kimball of Hood River, Orris Dorman of the Spokane Fruit Growers' Association, Fred Eberle of the Yakima County Horticultural Union and George Coburn of the Wenatchee Fruit Growers' Association.
Northwestern Markets—H. M. Gilbert, B. A. Perham of the North Pacific Fruit Distributors, H. G. Fletcher of the Northwestern Fruit Exchange, Conrad Rose and L. J. Blot of the Spokane Fruit Growers' Association.
Home Markets, including those on the Sound and West Coast—Wilmer Seig, C. R. McKee of the Thompson Fruit Co., B. A. Perham, G. W. Coburn and W. M. Nelson of the Yakima County Horticultural Union.

Wire Fencing for the Farm and Orchard.—The Department of Agriculture in its Weekly News Letter, says in reference to farm fencing that it should combine two qualities—service and economy. To give service it must turn all kinds of stock without injury. To be economical it must be built as cheaply as is consistent with durability. In selecting a wire fence it is preferable to economize by eliminating unnecessary wire rather than by using a lighter wire. The factor which determines the price of woven-wire fencing is its weight, so that in fences of the same height a wide-spaced fence, with comparatively fewer wires, costs less than the narrow space with more wires. An important factor in selecting wire is that a man should not use any smaller mesh than is necessary to turn the kind of stock for which the fence is built.

Mr. J. H. Robbins, manager of the North Pacific Fruit Distributors, tendered his resignation to take effect immediately, which was very much of a surprise to all of his friends throughout the Northwest. Mr. Robbins came to North Yakima and was one of the original organizers of the Yakima Valley Fruit Growers' District Association, which afterward entered the North Pacific Fruit Distributors, Mr. Robbins becoming general manager of the North Pacific Fruit Distributors. During his administration he has made many warm friends, who will regret his leaving the fruit industry. It is Mr. Robbins' intention to go into private business for himself. The reasons given for his resignation are on account of poor health and a desire to engage in private business.

A Standard Box for Apples.—The bill for standardizing a box for Northwest apples, which was introduced into the last session of Congress and pigeonholed, will again be presented to Congress this year by Mr. John E. Baker of California. This bill will have the endorsement of all fruitgrowers in the Northwest, and therefore will have the support of all Senators and Congressmen of the Northwest—in fact the entire Pacific Coast. The standardizing of all kinds of packages is highly desirable and is being demanded by the consuming public. There is no question in the minds of the fruitgrowers that we ought to have a standard box for apples, and the quicker we have a law the better it will be for the whole box-apple industry.

Permanent Tariff Commission.—The Chamber of Commerce of the United States, National Headquarters, Riggs Building, Washington, D. C., has just issued a very interesting circular which is well worthy of the attention of every citizen of the United States, on the tariff problem. These can probably be secured by request to the above address. On the cover page is a statement as follows: "Referendum of Commercial Organizations, 715 Votes for 9 Votes Against." It looks very much as if chambers of commerce, who understand trade conditions, will show a unanimous opinion in favor of permanent tariff commission.

The Pacific Fruit and Produce Company. North Yakima, Washington, according to the Exchange, have issued a circular stating they handled 1,210 cars of fruit and vegetables during the year 1915, paying the producers \$302,281.36. The Pacific Fruit and Produce Company shipped 181 cars of apples, 134 cars of peaches, 36 cars pears, 13 cars cherries, 4 cars prunes and 1 car of grapes. Their statement shows that in 1914 they shipped 14,480 boxes of apples at an average price of 61 cents per box. In 1915 they shipped 10,341 boxes at an average price of \$1.11.

Stark Bro's Nursery and Orchard Company Centennial.—One hundred years ago Judge James Hart Stark moved from Kentucky to Missouri, where he established the present nursery, the site of which was only a small part of the present plant. In Europe, where firms continue from one generation to another, such an announcement would not command much attention, but in America, where changes are made so frequently, it is something so unusual for one firm to continue one hundred years in business and be passed on from father to son for four generations that it seems worthy of some notice in the columns of "Better Fruit," and for the reason it indicates to the fruitgrower that when business is properly attended to there is a stability in the orchard business and the nursery business that most people do not realize. Stark Bro's Nursery is credited as being the oldest nursery in the United States, and so far as we know this statement is correct. The nursery is under the administration of the fourth generation, Edgar W. Stark being president; Lloyd C. Stark, his son, is vice-president. Other members of the Stark family connected with the nursery are: Thomas W. Stark, secretary; Paul C. Stark, chief landscape department; Clay H. Stark and Lawrence E. Stark, sales departments.

From a very small beginning the Stark Nursery, which illustrates the growth of the fruit industry, has grown to a very extensive proposition, with plants located at Dansville, New York; North Girard, Pennsylvania; Fayetteville, Arkansas; Marionville, Missouri; Huntsville, Alabama. At the present time the Stark Bro's Nursery is recognized as one of the largest in the United States. Stark Bro's Nursery has been very progressive and has introduced a number of new varieties of fruits, which have met with much favor, some of them having achieved a wonderful degree of success commercially by being recognized as standard commercial varieties. Among the varieties of apples introduced by Stark Bro's Nursery are King David, Black Ben, Senator and Champion. But perhaps no apple introduced in recent years has commanded quite the attention or achieved the degree of popularity as the Delicious, which is considered one of the most delicious eating apples grown, and selling at top-notch prices. Stark Bro's Nursery believe in advertising and publicity and spare no expense in introducing new varieties when they consider them worthy of introduction. It has been stated they spent one-quarter of a million dollars in introducing the Delicious and one hundred thousand in introducing Black Ben. Stark Bro's Nursery, in celebrating their centennial, one hundred years in the business, have just issued a new catalog which is called their "Centennial Fruit Book," consisting of 72 pages.

Fruit Shipments East and West Up to December 1.—According to figures compiled by A. A. Piper, local agent of the Great Northern, 2815 cars of fruit were billed from the Wenatchee station during the 1915 shipping season to December 1. This includes all fruit, cherries, peaches, cois, pears and apples of all grades. Of this number 2,189 were loaded at Wenatchee, the rest loaded at nearby stations and billed from here. The following table, giving Eastern and Western routings, is interesting in that it shows the percentage of the crop that moves east and west. Approximately 25 per cent of the tonnage is routed west, either for storage or for consumption on the Coast market, including Seattle, Vancouver and San Francisco, and for the Australian market. The carlot shipments are:

	East	West	Total
Wenatchee	1701	485	2189
Malaga	124	13	137
Monitor	37	4	41
Appledale	7	1	8
Palisades	20	37	57
Ohio Colony Spur.....	10	3	13
Malott	2	..	2
Winesap	13	1	14
Zona	3	..	3
Wagnersburg	43	10	53
Olds	286	42	328
Total	2249	596	2845

The foregoing does not represent total shipments from Monitor, as during October and November all cars were billed from that station.—Wenatchee World.

The Yuba Bulletin is the name of a quarterly publication issued by the Yuba Construction Company of Marysville, California, and contains much interesting information in reference to the efficiency and economy of tractors in connection with cultivation in the orchard and farm.

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Deer Park, Washington

Apple-Scab Control in Oregon

By H. P. Barss, Professor of Botany and Plant Pathology, Oregon Agricultural College, Corvallis.

REPORTS from different parts of Oregon during the past season indicate that Apple Scab has been unusually severe in many sections. The loss due to this disease alone will probably amount this year in rough estimate to over \$300,000 in this state. In many an unsprayed orchard there could not be found a single scab-free fruit this year, and even in orchards where the owners did spray, there was

often a seriously high percentage of scab, sufficient in some cases to remove all trace of profit from the ledger. The question arises as to whether these conditions must continue to exist. Is it really necessary for every particularly bad year to take this terrific toll from the Oregon orchardist? I am confident that there is no need of it. For several years the College has been conducting investigations on the con-

trol of apple scab and at the same time has been watching the work done by practical growers in this direction. From the results of these investigations and observations, the conclusion is forced upon us that, no matter how bad the year may be for this disease, the intelligent application of our present knowledge will result in satisfactory control.

So much has been written and said on the subject of Apple Scab that there is no need of describing the disease in detail. You understand that the parasitic fungus which causes it lives through the winter in the dead tissues of the fallen apple leaves, and that in the early spring a crop of spores is matured which are shot forcibly out of these old leaves and then, caught by the lightest air currents, are carried to the newly-developing foliage and fruit, causing on them the first scab infections of the season. It was for a long time thought that this crop of spores did not mature until about the time the blossoms open and that infections could not occur earlier. In Oregon, however, we have found that at least in some seasons these spores may be mature approximately a month before the blossoms open. Under such circumstances, if the weather conditions are favorable, infections may occur before the cluster buds are fully opened, often a considerable time previous to blossoming. These first in-

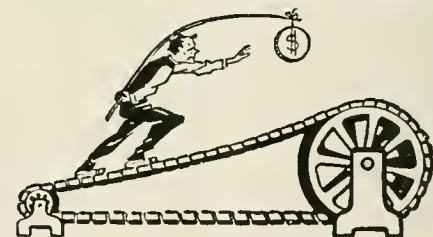
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fections will develop into typical scab spots on the young leaves and flower parts and in a week or two there will be a new crop of spores produced in these spots which, as you are aware, usually result in an exceedingly rapid spread of the disease in the orchard, attacking fruit and foliage alike.

There is now no longer any doubt regarding the natural conditions which make possible the spread of the disease. Moisture is absolutely necessary for the germination of the spores and those climatic conditions which enable the dew, rain or fog to remain upon the leaves or fruit for a considerable number of hours in succession, make it possible, where spores are present, for those spores to sprout and send their delicate germ tubes through the cuticle, after which the infections will take care of themselves. Anything that promotes rapid drying of foliage tends to prevent infection. Wind and sunshine, even though interspersed with showers, are unfavorable to the disease, while cloudy or misty weather with little wind, even though there be practically no rain, makes possible abundant spore germination.

Years ago, before the nature of this disease was yet fully understood, an effort was made to find some means by which it might be prevented. Bordeaux mixture had been found of such value in connection with certain other plant diseases that it was naturally one of the first materials tried out as a spray for the control of this malady. As long as twenty or twenty-five years ago in the eastern part of this country bordeaux was shown to be decidedly beneficial, and the large number of tests carried out since that time all over the United States leave no doubt as to its efficacy for scab control in the mind of any one familiar with the results. There was, however, one drawback in connection with bordeaux mixture wherever used, namely, the tendency under certain conditions to cause russeting of the apple fruit. It was thought at first that the mixture was being used too strong, but experiments demonstrated the fact that injury would occur when weak dilutions were used, and it was found that this could not be prevented by any change in the proportions of the ingredients. It was found that this injurious effect was present only on fruit sprayed when young, and it is now further understood that moist weather following the application of bordeaux mixture provides the most favorable conditions for the appearance of russeting.

With the introduction of lime-sulphur as a fungicide, experiments were begun throughout the country to test its usefulness as compared with bordeaux mixture for the prevention of apple scab. It was a great satisfaction to find that this new spray material was really effective for this purpose and that it did not produce on the fruit the objectional russeting caused by the other. Lime-sulphur has consequently superseded bordeaux throughout most of the apple-growing sections



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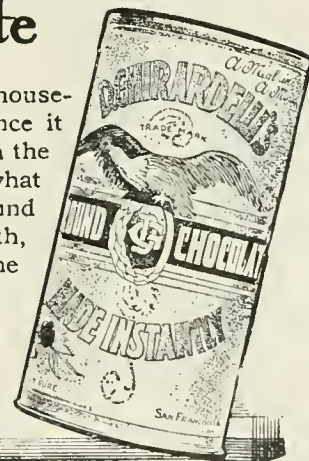
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the very qualities that have made it a household favorite on the Pacific Coast since it was originated by D. Ghirardelli in the early seventies. Not to know—and what is more, not to use—Ghirardelli's Ground Chocolate, is to be unmindful of health, economy and the appeal of a wholesome appetite.

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The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

of the country for scab control. Lime-sulphur, however, is not perfect in all respects, for in the higher strengths it will cause burning of apple foliage, and even in the lower dilutions, particularly with drenching, it may result in injury to foliage, although this is not usually of great importance. Under certain conditions, however, the injury may be quite severe, and in addition to scorch on the leaves there is also a serious tendency to cause sunburn on the fruit in hot weather. Complaints of the trouble just referred to come, I believe, largely from sections subject to at least occasional spells of very high temperature.

Other fungicides are now being tried out experimentally over the country and new combinations of fungicides as well, in an attempt to find a suitable spraying program which will give the desired control of scab and avoid at the same time the injuries which have been mentioned. The Agricultural College has been making tests for the past two years under the direction of Mr. Winston at the Hood River Branch Experiment Station and some interesting facts bearing upon the problems of scab control have been brought to light. Some additional investigations in which the writer was assisted by the horticultural inspectors of the state have laid bare many of the reasons for lack of success in scab control, and have pointed out the way to remedy some of the difficulties.

In connection with the work on apple scab in the Hood River Valley it was found that the period of most abundant scab infection in 1913 occurred in the latter part of June. In the following year, on the other hand, the most serious infection occurred previous to the time the flower buds showed color. Furthermore, during the season of 1915, the most disastrous infection occurred as a result of a long rainy period, commencing perhaps two weeks after the petals began to fall. Each year there were a great many growers whose apple crop suffered badly, but at the same time each year there were some whose apples were practically clean. Investigation showed that the men who had clean fruit were those who had made an application of fungicide not long before the critical period. This is illustrated also in one locality in Southern Oregon, where during the past season there was a spell of wet weather favorable to scab four or five weeks after the bloom fell. In an orchard where the owner gave the usual four applications there was but 5 per cent of scabby fruit. Another grower in the same district gave three sprayings, with excellent control as far as he went, but omitted the fourth application. After the rainy period referred to, 70 per cent of his fruit developed scab spots.

It is evident, from these examples, that in Oregon there is such variability in weather conditions through the spring, that in order to be certain of a clean crop the grower must protect his trees by a suitable fungicide

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

throughout the entire season from the time the buds begin to open until all danger of scab-favoring weather is past, or else he must acquire more skill as a weather prophet than most of us ever hope for. In addition to the poor results which have come from failure on the part of the growers to keep their trees protected at all times during the dangerous period, we must mention the poor results that are attributable to lack of thoroughness. There are abundant instances in our apple-growing sections where two neighbors using practically the same spraying schedule will have entirely different results as far as scab control is concerned simply because one has always done the work thoroughly while the other has not. Too great emphasis cannot be laid on thoroughness. Growers must understand clearly that any portion of the surface of a fruit or leaf not covered with spray mixture naturally remains unprotected against infection. A spore can germinate and penetrate fruit or foliage at any point where no fungicide has been deposited.

I wish to call attention to the desirability of destroying or plowing under the fallen leaves. Wherever this has been thoroughly done there seems to have resulted a marked diminution in the primary spring infections. I doubt whether it is possible to do so thorough a job, however, that spring spraying could safely be abandoned; but present evidence indicates that it is a desirable practice which ought to be encouraged. It may perhaps be possible to destroy the fungus in the fallen leaves by some spray applied to them after they have fallen, but experiments with the standard fungicides have given negative results. These, however, form a practically insoluble coating on the exterior of the leaves and would not be likely to have any effect on the fungus which in this stage lies protected within the leaf tissues. My attention, however, has been called to an orchard in the Willamette Valley badly affected with scab last year where the owner sprayed part of it this spring just as the buds were swelling with pure blue-stone (copper sulphate) at the rate of 2 pounds to 50 gallons of water, while part was left unsprayed. No further fungicidal application was given. It is reported that on the sprayed section

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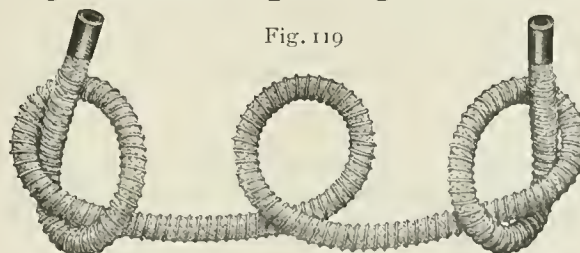
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are like truth; old yet ever new. Common sense teaches that the overthrow of thrift is the death blow of selfrespect. Find yourself in this regard. Open a savings account in this well established state bank; it will be a solid tribute to your selfrespect.

Oldest in the
Northwest

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Portland
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85 per cent of the fruit was free from scab, while the unsprayed part yielded 75 per cent of scabby fruit. The only explanation I have to suggest is that the application of copper sulphate reached the ground covered with old leaves and, penetrating these, killed the fungus, thus preventing spore production from them and the consequent early infections. I give this to you for what it is worth, since the case did not come under my direct observation and the method has, as far as I know, never been tried out experimentally. I believe it worth further investigation, however.

Regarding the use of different fungicides, our experiments in the Hood River Valley have shown that various results may be expected, according to time of application and the conditions to which the trees are subjected. We have found that bordeaux and lime-sulphur cannot be surpassed as fungicides, but injury may be expected under certain conditions to which I have already referred. Atomic sulphur is not likely to cause much injury when its use is begun while the foliage is young, but in cool weather it seems to be much less efficient as a fungicide than the standard materials, while if the first application is made late in the spring, according to some growers, a considerable leaf-dropping may follow. A new preparation tried out for only one season, Barium-Sulphur, seemed to give a fairly satisfactory scab control with the least injury of any substance tried. Further tests, however, should be made before any general adoption of this material can be advised.

It is evident from the foregoing that the intelligent grower must base his spraying methods upon a knowledge of the disease, and the factors that influence it, together with an understanding of the materials that may be employed for fungicides and the conditions under which they may be safely used. There is absolutely no question but that apple scab can be successfully controlled anywhere in Oregon if the fruit and foliage are properly protected. Spray injury may not always be avoided, but much of it can be prevented by a wise selection of the material to be used at any particular stage.

Present Recommendations.—We have found that in our scab control experiments lime-sulphur gave better results with less injury than any other fungicide which has been used throughout

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from owner of good farm for sale.
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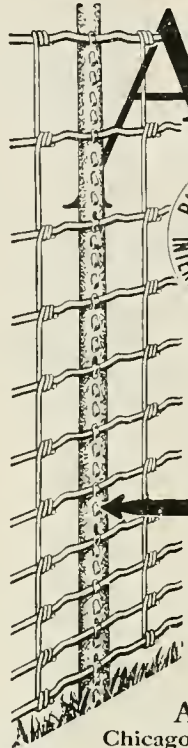
Western Pine Box Sales Co.

HIGH GRADE FRUIT BOXES
 APPLE, PEAR AND PEACH BOXES
 Fruit and Vegetable Crates
 GOOD SERVICE—Write us
 SPOKANE, WASH.

the season, and we therefore recommend it to those who prefer sticking to one kind of material throughout. The first application for safety ought to be given just after the cluster buds unfold and before the leaves get to be much larger than squirrels' ears. This "semi-dormant" application gave an increase of from 30 to 60 per cent in clean fruit over plots sprayed first in the "pink" in one of our Hood River orchards this year. We used lime-sulphur, 1-20, and added a nicotine sulphate preparation to take care of the insects. Some burning was experienced and possibly a slight dwarfing of the first leaves, but the injury was insignificant in view of the benefit derived. The second application should be made in the "pink" stage, that is, just before the blossoms open. Here we used lime-sulphur, 1-35, with good results. Bordeaux caused russeting in our plots last season where used at this time, contrary to the usual expectations. The third spray is the "calyx" spray, applied when most of the petals have fallen. Lime-sulphur, 1-35, with arsenate of lead added for codling moth, should be used. The fourth spray should be given about "ten days" later. Under average conditions lime-sulphur, 1-35, seems to give the most satisfactory results. A fifth spray ought to be applied a month after blossoming and where the down has disappeared from the fruit, especially in the case of varieties not extremely subject to russeting, Bordeaux may be used in the 3-3-50 or 4-4-50 strength. I am convinced that the omission of this application is not safe in most Oregon apple sections. Lime-sulphur, 1-35, may of course be used where burning is not feared.

The summer season is rarely favorable to scab, and where the orchard has been well taken care of in the spring there will be little trouble from serious new infections in the average fall. It would be safer, of course, to protect the fruit with an application of Bordeaux or lime-sulphur sometime in August or early September. I have a feeling also that if the foliage were well covered in the fall from the start, few leaves would receive the infections which ordinarily result in the development of the winter stage. In other words, the primary spring infection might be materially reduced. The majority of previous experiments with fall spraying have, I suspect, begun too late to be effective. During the past season, bad as it has been, many growers from different sections of the state have secured a crop of 90 to 95 per cent clean fruit when their neighbors had only 5 to 25 per cent free from apple scab, with only spraying to account for the difference. Whenever there was failure in spraying it is attributable in practically all cases either to failure to have the trees protected at some critical time or to lack of thoroughness in doing the work. Apple scab can be controlled in this state or any other "when the right materials are used in the right way and at the right time."

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We have a choice lot of Italian in both 4/6 and 3/4-foot grades, well rooted and absolutely free from borers or any disease, and at lowest prices. We also grow a general line of nursery stock, including Apple, Pear, Cherry, Prune, Plum, Peach, small fruits, ornamental trees and shrubs, evergreens, roses, etc. First-class stock at lowest prices. Write for free illustrated descriptive catalog. Special prices on large orders.

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The Success of a Fruit Grower

depends largely on the way he cares for his orchard. Unless it is well cultivated he can not hope for good results.

For this work there is nothing that will equal

The Kimball Cultivator

in keeping the ground in perfect condition at a small cost.



The price is in reach of the small grower and can be bought from your local dealer or from

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Two minutes saves each tree

Use Tree Tanglefoot

on Shade and Orchard Trees against Gypsy, Brown-tail and Tussock Caterpillars, Canker Worms, Climbing Cut Worms and Ants. It is equally effective against any crawling insects.

Band Trees About Two Weeks Before Insects Appear to Get Best Results

Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application stays sticky 3 months and longer—outlasting 10 to 20 times any other substance. Remains effective rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing, simply open can and use. Will not injure trees.

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Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will water-proof the crotch of a tree, or a cavity, or wound in a tree, when nothing else will do it.

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1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50, and 25-lb. wooden pails \$6.75. Write today for illustrated booklet on Leaf-eating Insects. Mailed free. (55)

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Dependable Brand Lime Sulphur Solution

The Standard Solution for the Fruit Growers of the Northwest. Highest percentage of Sulphur in Solution in proportion to Baume test of any brand offered on the market.

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Points to remember when consigning
apples to the London Market

1.—We Specialize in Apples

2.—All Consignments Receive our
Personal Attention

3.—The Fruit is Sold by
Private Treaty

CABLE ADDRESS: BOTANIZING, LONDON

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

Cheer for Fruitgrowers

Continued from page 12

"The association had plenty of fine fruit in its own cold storage to supply demand through these new outlets created by real salesmanship. But as soon as healthy distribution began individual growers in the Northwest would ship in two or three cars that represented their whole crop and sell a little below association prices. In a little while box apples were on the toboggan slide, and the individual growers often got less than freight charges for their fruit.

"This price was scare, pure and simple. There was no glut in those markets. Dealers had been shown how to make money out of box fruit, but the small individual shipments of a few cars, coming in at a slightly lower price, destroyed confidence. The fruit dealer who had his money invested in box apples did not know how cheaply his competitors would be getting similar fruit tomorrow. So he closed out his holdings and turned to barrel apples, or oranges, or something with greater stability.

"The unorganized grower brings price panic into the market in this way again and again, pulling prices down to a ruinous level, causing loss to all growers and dealers. He sets out with the idea, usually, that he can market his stuff himself to better advantage than anybody else can do it, and he winds up by selling it at a price five to ten cents below the market, because he lacks the real selling ability and the broad market information that would enable him to dispose of his fruit at a profit.

"In the produce trade there is also the small, fly-by-night buyer who picks up a few cars of stuff in growing districts, ships them to a good market and sells a nickel or dime below the true value in the same way.

"Together, these two pests cause enormous losses every year to growers who have organized for orderly marketing of crops, and to produce firms which would invest heavily in fruit and truck if they could count upon stability."—Hood River Glacier.

Apple Exports to Europe.—According to Mahlon Terhune, freight broker and forwarding agent of New York City, the following are the barrel-apple shipments of 1914 and 1915, for the weeks ending as follows: October 30, 1915, 105,610; October 30, 1914, 107,898; November 6, 1915, 51,207; November 6, 1914, 75,911; November 13, 1915, 87,451; November 13, 1914, 73,151; November 20, 1915, 85,359; November 20, 1914, 98,720; November 27, 1915, 75,030; November 27, 1914, 126,865; December 4, 1915, 102,588; December 4, 1914, 111,121. Apparently there is not such a great difference in the volume exported as most people imagine. However, space on steamers at the present time is very difficult to obtain for export and arrangements very uncertain, for the reason every now and then vessels are commandeered.

The Exhibit of the Schmidt Lithograph Company at the National Apple Show, held in Spokane, contained two features in connection with the box of apples packed under the "Skookum" brand that are well worthy of the fruitgrowers' attention. These two features being the beautiful price card and also the corrugated layer paper which was used for the purpose of preventing bruising by the lid and bottom of the box.

DOW ARSENATE OF LEAD

For the past eight years this material has successfully lead all others. Quality is our watchword, and you can use *Dow Arsenate of Lead* with the feeling that you have the best that money can purchase. When the codling moth is as numerous as it has been the past season, it affords a good opportunity to demonstrate the real value of *Dow Arsenate of Lead*, and the record it has made in the Northwest the past season should cause you to insist upon this brand for the coming season's work. Address us for names of distributors in the Northwest, and we will be glad to refer you to one in your community or close by.

The Dow Chemical Company, Midland, Michigan

The Commission Man as a Market Necessity

By E. S. Gill, Seattle, Washington

It may well be said that the whole care of fruit from the beginning of the growth of the trees to the final marketing is a most complex problem. This convention, made up almost entirely of growers, knows that the growing of fruit in the Northwest is indeed a problem and it can only be made successful by those who become experts in the business. The same may be said of the marketing end. The day when anyone could become a fruitgrower, that is, a successful one, has long since passed away, and so it is with the selling.

Selling in these days requires trained and skilled men.

For a number of years there has been a great hue and cry about eliminating the middleman. He has been called a robber, a pirate, and about everything else that could be suggested as referring to a dishonest person. But when all is said and done the people of sober sense realize that these epithets have been bandied about by the unthinking, and that the middleman is very much of a right-minded human being just as are those in other walks of life. He has filled a place in the business of the world that modern conditions have created, and we could no more carry on business without him than we could pack apples without the boxes to pack them in. Inventions of the last forty years have changed the whole method of doing business, both wholesale and retail. The day when the grower could drive into town and meet the consumer has passed, never to return.

The consumer may talk occasionally about wanting to be able to buy from the producer, but it is only the expression of a dream thought, for when it comes to actual practice the consumer will not change from his present convenience of going to the telephone and calling his favorite grocer and giving an order. So the grocer has found that in order to always be able to fill the wants of his customers he must be able to secure goods when wanted, and in order to do this he must patronize the jobber, or what we designate in the fruit business, the commission man. The commission man, like the retailer, is a necessary outgrowth of modern business conditions. Retailers found that they could not depend upon the growers. Shipments were irregular and not always well prepared, and as a consequence men stepped in to superintend the shipment and receipt of goods at the large centers so as to always insure a supply as needed. These men handled goods sent into the big markets on a commission basis, acting as selling agents for the shippers and as warehousemen, storing goods when the market was oversupplied, or repacking when the goods

were not in the right condition for the market, endeavoring in this way to secure the largest possible returns for the consignee.

In recent years it has been quite the fashion in nearly all walks of life to abuse and denounce all those who were apparently successful financially. We have heard a great deal about "Big Business," so much so that in recent years every successful man has been classified as a member of "Big Business." In the hue and cry, the commission men have been the object of special attack, these attacks going so far in this state as to include legislation seeking to not only place safe-

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Larger than runway;
jaws pull rodent in;
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Farmers say it's worth dozen other makes.
Big sales. **Price 50c.** If not at your dealer's will send
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Money back if you are not satisfied. Free circulars.
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Insecticide—Tonic—Fungicide

WHEN other spray materials fail to do their work, because rain washed them off, "ADHESO" STICKS, killing the Codling Moth and preventing the Scab, Apple Blotch and Bitter Rot, because IT STAYS WHERE IT IS NEEDED and does not wash off on the ground.

"ADHESO" GAVE 99 CLEAN FRUIT THIS YEAR, the worst in fifteen years for Codling Moth and Scab.

Write for details and means for making the STANDARD TEST FOR ADHESION.

"Triangle" Brand Arsenate of Lead

The reason why our Arsenate of Lead costs more than others, was shown this year. Ask the growers who used it. They DID NOT LOSE 50% to 75% by WORMY APPLES. It is not the COST PER POUND but RESULTS IN CLEAN FRUIT THAT COUNT.

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YOU CAN EARN \$50.00 PER DAY
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Gearless Improved Standard
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Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2 1/2 gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8.

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All Refinery Gas—not a mixture

Dealers everywhere and at Service Stations of

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Red Crown
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Send for this free book on land clearing. It tells how to get your stumps out cheaply and quickly—without teams, digging, or blasting—with the

K HAND POWER Stump Puller

With its 26:1 leverage one man can pull any stump that can be pulled by any horse power machine. Owners report pulling from 50 to 100 stumps per day. Made of Krupp steel—weighs only 171 lbs.

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guards around the honest commission man and shipper, but attempting to say what the commission man should charge for his services.

This is radicalism run mad. The secretary of this honorable body is a Consulting Horticulturist, probably the first man in the United States to take up that line of work as a profession. He is an expert in his line and is entitled to such fees as people will pay for his services. Yet that is just what the legislature of 1911 attempted to do with the commission men. After prescribing that they should file bonds—something that everyone favored, as it would help to keep out the irresponsibles—the law prescribed in so many words that the commission man doing business in the State of Washington could only charge ten per cent for his services.

Ten years ago, and even up to two years ago, commission men were trying to do business in this state on the basis of ten per cent. Ten years ago they were making a reasonable profit at that figure, but about that time a period of freak legislation began when loud-mouthed agitators were going to remedy all the ills of mankind by law. The enactment of these laws have been a most potent factor in increasing the cost of doing business in this state. Taxes, for instance, have been more than doubled. Wages have increased with the increasing cost of living, rents have been on the upward trend and the general overhead expense of doing business has increased not fifty per cent but from seventy-five to one hundred per cent in the last ten years, until the commission men found they were not making expenses on a ten-per-cent basis and raised the fee to fifteen per cent.

There is not as much profit in fifteen per cent commission in this state today as there was in ten per cent ten years ago, and I want to say to you now, that unless the horticulturists join with other lines of business to put a stop to the freak legislation of recent years, the commission in this state will go up to twenty per cent, the present basis in our neighboring country of Canada. To decry all jobbers and commission men as robbers and thieves is as unjust and unthinking as to denounce all fruit-growers as tricksters and robbers, because forsooth some few try to work off a large percentage of their fancy and C grade fruit into the extra fancies. Taken as a whole the fruit jobbers, or commission men, if you please, are as honorable a set of men as you can find in any other line of business. Firms like some of the older ones in Seattle, that have been in business for 25 to 30 years, could not have gone on all these years if they had been owned and controlled by dishonest men. Old firms like some of those in New York, Chicago, Pittsburg and other cities, that have been in business from 30 to 50 years could not have continued all these years if they had not dealt honestly with their patrons.

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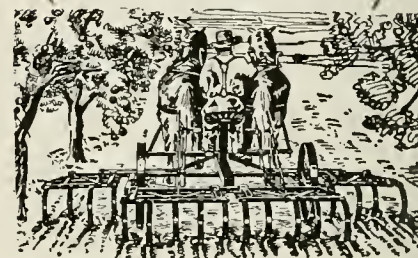
Does more work with less draft and leaves a better dirt mulch than any other cultivator. It

WORKS RIGHT UP TO YOUR TREES

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is the result of successful tillage. Cultivate your trees as you would your corn—use an

"Acme" Orchard Harrow
It gets in close under the branches. Cuts, slices, turns the soil twice, levels and compacts—all at one operation. Many sizes—extension and regular. Kills small weeds, cultivates deep, mulches thoroughly. Send for new free booklet—now.

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After two years' trial of "From the Producer to the Consumer" marketing plan, the Department of Agriculture recently issued Bulletins Nos. 266 and 267, in which it says: "The development of transportation facilities and the extension of our agricultural area have widened the distance between producer and consumer. This is as true commercially as it is physically. The extensive commerce in food products has called into existence many special agencies in that large class known as 'middlemen.' During recent years there has been a great deal of agitation against those engaged in food distribution. It is probably not going too far to say that, to the uninitiated, the middleman is a rather hazily defined person, whose chief function is to levy, arbitrarily, a heavy tribute on all food-stuffs passing from the producer to the consumer. The attention of the public has been directed to increased costs rather than to service rendered. Evidently it has never occurred to many who clamor for reform that economic conditions would not permit the long-continued existence of a marketing agency which was simply a parasite. Sooner or later business competition must eliminate all intermediate agencies which perform no definite useful function."

The bulletins further discuss the relations of producer to commission man, pointing out the difficult and trying position of the commission man in dealing with the producer at long distance, and in closing says: "In general, it may be said that a large part of the stigma which attaches to the business of the commission merchant arises directly from the difficult position which this middleman occupies in distributing machinery." I wish every one here would secure a copy of these two bulletins. I believe they will help to clear up some of the misunderstandings and suspicion of the past.

Let us get together and work out our mutual difficulties as hard-headed, practical men. I can assure you on behalf of the commission men of Seattle that we are ready at all times to co-operate with you in the enactment of legislation for our mutual good. Reputable commission men favor bonding those engaged in the business. They all use a uniform system of accounting by

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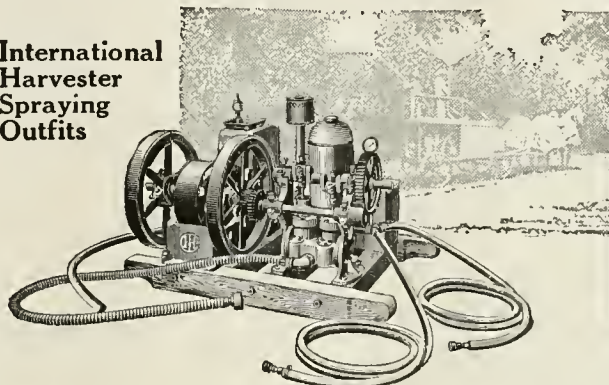
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International Harvester spraying outfits are adapted to small and large orchards, vineyards and truck gardens, and are made in several types — on skids, on portable hand trucks or complete with tank, platform and wagon.

See the **I H C** dealer about an outfit. We have an interesting Spray Book containing reliable information on how and when to spray, and what to spray for. Write for it.

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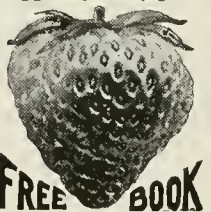
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NORTHWESTERN AGENTS
PRATT'S "SCALECIDE"

which itemized account sales can be furnished on request, but they know and you know that you cannot fix by law a price at which a man must conduct his business, whether that price meets his expenses or not. I believe I can see this question from both sides of the line, for my interests in the growing of fruit are greater than those in the marketing end. But fairness and square dealing is necessary from both sides, and to this end I assure you the commission men of the state are ready and willing to work with you.

Getting Together in Marketing

Continued from last issue

Next to creating a disposition to get together, the important move just at present is to get the jobbers and dealers on the consuming end to help us increase our outlets. It is a waste of energy to think of building up a competitive organization to our present jobbers. Our best success depends on getting their co-operation, getting their hundreds of traveling fruit salesmen to help us get the communities they visit ready for our fruits, at the proper time, before the fruits are too ripe and markets glutted. In the past, the fruit salesman in the Middle West has been telling the retailers to wait for the glut, and they have waited. We want to get our joint-selling boards and reciprocal marketing arrangements so perfected that the trade will not wait but will order from the first. I believe an organized effort should be made through the Western Fruit Jobbers' Association, representing all the jobbers west of Chicago. Live distributors at the other end who are familiar with our problem can be of great assistance to us in preparing markets to take a much larger supply than they now take. I think a committee from the Northwest fruit shippers should be sent to the January meeting of the Western Fruit Jobbers' Association to be held in Memphis and secure their co-operation.

Another thing we need is more sympathetic co-operation of railroads—loading in transit and unloading in transit, less heater charges and diversion charges, and less freight rates, especially apples to Chicago. It has been suggested that 20,000 cars of apples are likely to be grown in the Northwest next year, and that we may fall down marketing them. It is not whether we have ten thousand or twenty cars to market, we only have from six to ten per cent of the apple crop of the United States in either event. The big factors are, first, whether we are organized properly to market any amount, and, second, fruit-crop conditions elsewhere and world conditions. If we cannot get our statesmen to provide a merchant marine; if we cannot get the railroads interested in our industry except to see what new taxes and hardships they can impose upon us, we are indeed in hard straits. But I believe if we go after it in earnest, if we get together and work together, we can get necessary con-

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GOOD AS CAN BE GROWN
Prices Below All Others
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Over 700 illustrations of vegetables and flowers. Send yours and your neighbors' addresses.
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DON'T take chances with your young trees. One rabbit will kill many in a single night. Mice and cut worms will damage and destroy them if you don't protect them. Get dollars' worth of protection at a fraction of a cent cost by using
Hawkeye Tree Protectors
Absolute protection against gnawers and borers. Prevent trees from becoming skinned and bruised by cultivator or lawn mower. Made of elm veneer, chemically treated. Easily put on and will last until tree is beyond needing protection. Don't wait until some of your trees are killed—order Hawkeye Protectors now. Regular size 10 inches wide, 20 inches high. Price in lots of 100—1 cent apiece, in lots of 1000—1/4 cent apiece. Special sizes made to order. Write for circular and samples.
We make Fruit Baskets—get our prices.
Burlington Basket Company
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Tells why chicks die
F. J. Reefer, the poultry expert, 3392 Reefer Bldg., Kansas City, Mo., is giving away free a valuable book entitled, "White Diarrhoea and How to Cure it." This book contains scientific facts on white diarrhoea and tells how to prepare a simple home solution that cures this terrible disease over night and actually raises 98 per cent of every hatch. All poultry raisers should certainly write Mr. Reefer for one of these valuable FREE books.

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BURLINGTON, IOWA
Ask for Catalogue No. 5

cessions from the railroads, we can get co-operation from the wholesalers and jobbers, and unitedly we can get distribution of our fruits.

We have had black days for all kinds of business, we have had hard times for wheat and grain farmers. I remember raising oats for eleven cents a bushel and wool for ten cents, and corn and hogs at a loss. The men who stay with the fruit business will yet see good profits in fruit. Our business is not to be blue; look up, not down. Look forward, but we ought to get together in a practical way and do things like men with common sense, to retain all our fruit outlets and multiply new ones. We can and we will succeed if we get all our forces together—take the growers and shippers as they are, and unite all the marketing forces in a practical, feasible way.

Horticultural Notes

From time to time in the past "Better Fruit" has mentioned various exhibits made at the Panama-Pacific Exposition that would be of interest to the fruitgrowers, as information was received from various sources relative to these exhibits. It is with regret that these notes have not been more complete. In the way of explanation, it must be said that "Better Fruit" had asked one of the men connected with the fruit industry to write a page or two of notes on all exhibits made at the Exposition that would be of interest to the fruitgrowers. However, this failed to materialize on account of the pressure of other business. The Friend Manufacturing Company of Gasport, New York, manufacturers of power outfits, has a very interesting and attractive exhibit at the Panama-Pacific Exposition. They are to be commended for this for the reason they are located so far from San Francisco, making a heavy extra expense on account of the distance. The Friend exhibit consisted of their spray outfits, spray nozzles and other features connected with their output. The Friend Manufacturing Company do a very large business in New York State, and an extensive business throughout the United States. That their exhibit was worthy of merit is evidenced by the fact that they obtained the Medal of Honour, which is only given to exhibits of very high merit. In addition, the Friend nozzle received honorable mention.

Winter Rhubarb.—For the past few years "Better Fruit" has been advising several kinds of diversity for the fruitgrower, which are very much needed for the following reasons: In the years when the production is heavy prices are apt to be low, and in years when the prices are high sometimes the quantity is shy. In addition to this, fruitgrowers only get returns once a year, and therefore if they can add a few side lines, or even one good side line, which will bring in some money regularly will be found to be a big help financially. "Better Fruit" has recommended dairying, hogs, bees, truck gardening. Quite a number of fruitgrowers have made a splendid success and good profits by growing asparagus; others have engaged in a more general line of truck gardening. The Northwest is dependent upon California for its early-spring vegetables, which of course are very expensive on account of freight. There is a variety of vegetable grown in California, which is being introduced by Mr. Wagner, called Winter Rhubarb, which, we are advised, thrives in a very rigorous climate, grows quickly and produces very bountifully. It has generally been recommended that it should be planted some time during the months of October, November and December, but if planted early in January there would probably be sufficient time to produce a very early spring crop, which would bring in some extra income for the fruitgrower at a handy period.

"Sweet-Corn Culture," is the title of a new book edited by Mr. Wilkinson, which is an excellent treatise on growing sweet corn, published by the Orange Judd Company, 315 Fourth Avenue, New York.



Our Motto

HIGHEST QUALITY

OUR 1916 ANNUAL CATALOG

Written, compiled and printed especially for the Western Planters of Seeds, Plants, Bulbs, Roses, Trees, etc., and users of Sprays, Spray Pumps, Fertilizers, Incubators Brooders and Garden Supplies.

A Reliable, Honest, Truthful Guide Free on Request

New Policy: "Direct from Grower to Planter." **No Agents. Charges Prepaid.** Ask for 1916 Catalog, No. 27.

ROUTLEDGE SEED & FLORAL COMPANY
169-171 Second Street, Portland, Oregon

Burpee's Seeds Grow

The Fortieth Anniversary Edition of Burpee's Annual, the Leading American Seed Catalog for 1916, is brighter and better than ever before. It offers the greatest novelty in Sweet Peas, the unique "Fiery Cross", and other novelties in Rare Flowers and Choice Vegetables, some of which cannot be had elsewhere. This book of 182 pages tells all about proved and tested Seeds. It is mailed free. A post card will do. Write today, mention this publication.

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I also have Plum and Prune Trees budded on plum, and budded berry-bearing and seedling Holly Trees from 2 to 5 feet. Also Mazzard Cherry and Marianna Plum stocks for nursery planting.

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In use in more successful orchards than all other makes. Used by U.S. Department of Agriculture. Find out what Eclipse offers in more profits for orchards, vineyards or potato fields. Address Morrill & Morley Mfg. Co., Box 12, Benton Harbor, Mich. Send for Free Catalogue

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LET me send you an engine to earn its own cost while you pay for it. **Easy to start; no cranking;** easy to understand and manage; and easy to pay for on any suitable, reasonable terms of payment, during a year. I have helped many thousands to own engines in this way, during my 29 years of engine building.

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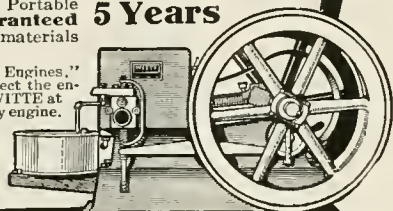
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Plantation four miles southwest of station, Belmont Road
We will be pleased to show you trees, apple trees that have a heritage, a quality that should be considered by everyone who plants a tree. Our trees are grown in clean hillside virgin red shot soil with clay subsoil, producing the most vigorous root system. Our buds are selected from the best bearing healthy Hood River trees that make the Hood River apple famous throughout the world. Our trees will give you satisfactory results in vigor, fruit and quality. Ask for catalog. We guarantee our products. Apples, pears, peaches, apricots, almonds and walnuts. A complete line of the best varieties of all kinds of fruits.

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Most Desirably Located. In the Center of Shopping and Theatre District
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GEO. C. OBER, Manager

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The North Pacific Fruit Distributors, November 10th, issued a very interesting circular showing a Twenty-eight Months Record, some of the information being in reference to the volume of business. In twenty-eight months the North Pacific Fruit Distributors have distributed \$826,701.74; the total number of cars handled during this period was 12,276. The operating cost for the season of 1915 on the date mentioned was \$56.96 less than the budget prepared in advance. Quick returns are indicated by the statement that the average time elapsing between the dates of shipment and remittance of proceeds from the central office to the shipping associations has, for the present season to date, been twenty days. Carlot sales were made to 367 cities in 1914, compared with 213 cities in 1913. Exports through foreign ports in 1914 showed an increase of 321 per cent. Statements are also made that the North Pacific Fruit Distributors, supported by seven branch offices and one hundred exclusive sales agents, enabled the Distributors to make cash f.o.b. sales on 97½ per cent of its fruit. On 12,276 cars sold, the total loss through inability to collect is stated as being \$418.07.

Mr. J. B. Knapp, secretary of the Pacific Coast Veneer Association, has advised "Better Fruit" that the Pacific Coast Veneer Manufacturers are showing their interest in caring for the fruit industry by endeavoring to formulate some sort of plan whereby warehouses can be established in the different fruit sections which will carry a supply of containers for all kinds of small fruits. Such a move on their part will certainly be greatly appreciated by the fruitgrowers in the different districts. It is only by bringing containers for small fruit into different fruit districts in carload lots that they can be obtained at a minimum figure. Individual growers are not able to order in carload lots, so if some source of supply can be established in the different fruit districts it will be a big factor in enabling fruitgrowers to purchase the number of containers they require at minimum cost, and in addition to this it will be a big convenience, which will be highly appreciated by all fruitgrowers.

New Fruit Creations.—The Pitless Prune and the Plumcot are two comparatively recent creations by Luther Burbank. Both fruits have been sold in San Francisco by Levi Zentner Company. It is stated the Pitless Prune has a pit no larger than the size of a pea in a very small cavity. Commission men say, judging from its initial appearance, that it will be a serious competitor of the Standard French Prune. The Plumcot was created several years ago, a cut of this plum appearing on the cover page of the January, 1908, edition of "Better Fruit." It is a red fruit, nearly two inches in diameter, with a smooth skin like the plum, with the apricot flavor predominating. Fruitmen consider it a valuable addition to the fruit markets. Another creation by Luther Burbank is the Giant Cherry, which has been grown commercially to some extent in Vacaville Valley, California.

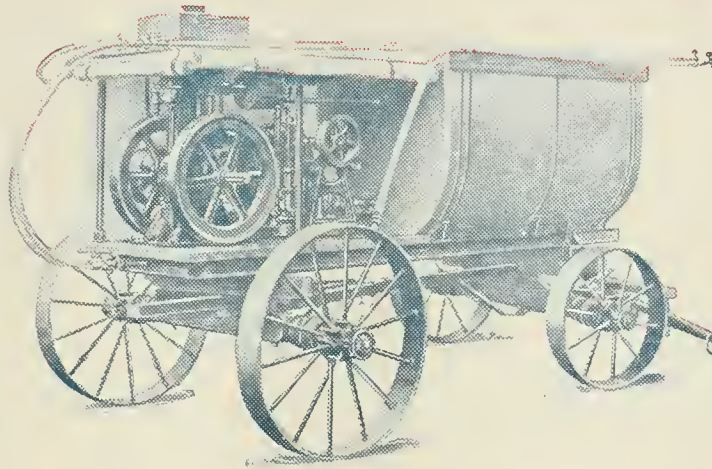
The Indiana Apple Show was held at Indianapolis, Indiana, November 6th to 13th, showing a marked improvement in quality and the number of exhibits over previous shows. Everyone who attended felt fully repaid, because the apple show was a splendid success in every feature. In addition to the show, there was a splendid program for the fruitgrowers, consisting of a number of good addresses by the ablest men connected with the fruit industry. The Purdue University exhibit was a notable feature of the show, the principal feature exhibit being a hollow apple sixteen feet in diameter covered with Ben Davis apples, it requiring 18,000 Ben Davis apples to cover this immense structure.

Apple Exports to South America.—According to Mallon Terhune, freight broker and forwarding agent of New York City, the following are the box-apple shipments to South America in 1915: October 30, 22,960 boxes; November 13, 27,194 boxes; November 27, 17,158 boxes. In addition to this, quite a large quantity of pears, grapes and other fruits were also exported to South America.

Grandview, Washington, has completed arrangements for the erection of a cannery. The building will be commenced about February 1st. The cannery is intended to put up apples, peaches, pears and other fruits, and later on will take on the canning of vegetables.

THE HARDIE Manufacturing Co.

Our many models enable the orchardist to equip his orchard with the machine meeting his individual requirements in size, construction and price.



The Western Triplex is the all-around sprayer. The detachable truck can be used for general farm purposes as well as on the sprayer. Its ample power and capacity meets the requirements of the largest growers.

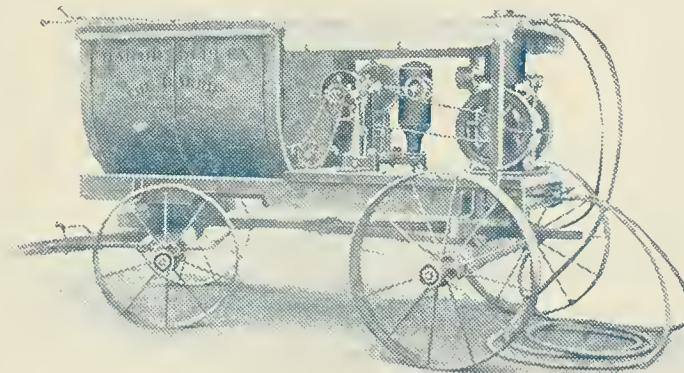
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All Hardie Sprayers are made up by specialists who have devoted years to this one line.

To any grower who seeks not only spraying results but economy of operation and upkeep as well, our machines will prove of the greatest interest.

Our line is broad enough to fill every spraying need and specialized enough to fit every individual orchard requirement.

Smaller than our Triplex, it is strongly built and carries the same high quality of design and materials.



All Hardie Pumps have our Peerless Pressure Regulator. All Engines have built-in, gear-driven magnetos. All are built for hardest continuous service.

THE HARDIE DUPLEX

On proper spraying much of your profits depend. Now is the time to plan for a better crop for 1916 by writing today for our new catalog which tells the complete story of the

Hardie Power Sprayers, Hand Pumps and Accessories

The Hardie Manufacturing Co.

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PORTLAND, OREGON

THE WORLD

OUR ORCHARD

STEINHARDT & KELLY

One Million Dollars in Box Apples

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They come to us year after year to give us preference in prices for these good reasons:

FIRST—We can dispose of larger quantities of their fruit than any other house in the country.

SECOND—We have been their best patron for many years and have always met our obligations punctually.

THIRD—We have more actual consumers of fruit, who keep on coming to us year after year because we take the best care to satisfy their wants and requirements.

FOURTH—Taking our entire holdings we handle more high-class stock than any house in the country.

FIFTH—We personally select our fruit in the growing centers, not so much with the sureness of profit as for the certainties of excellence and the belief that we know what our trade deserves.

SIXTH—The growers from whom we purchase get ideas from us as to what the very finest trade want and they know that we have helped raise the standard of excellence of the fruit industry.

But as to being proud—we are most proud, not only of our customers, but also of the growers, without whose help our efforts would be practically in vain.

We believe we have succeeded in assembling under our direction the very best packs of box apples from the premier districts of the Northwest.

We desire to herewith mention the names of a few concerns whose output we handle on this market:

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NORTHWESTERN FRUIT EXCHANGE and Allied Connections
CASHMERE FRUIT GROWERS' UNION
PESHASTIN FRUIT GROWERS' ASSOCIATION
WENATCHEE GROWERS' EXCHANGE
HOOD RIVER FRUIT GROWERS' EXCHANGE
SEBASTAPOL APPLE GROWERS' UNION
MOSIER FRUIT GROWERS' ASSOCIATION
WENATCHEE VALLEY FRUIT GROWERS' ASSOCIATION
YAKIMA FRUIT GROWERS' EXCHANGE
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Etc., Etc.

Steinhardt & Kelly

NEW YORK

OUR MARKET

THE WORLD

APR 1 1916

BETTER FRUIT

VOLUME X

MARCH, 1916

NUMBER 9



A NEWTOWN PIPPIN.

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Eat apples every day"

Buy them by the box

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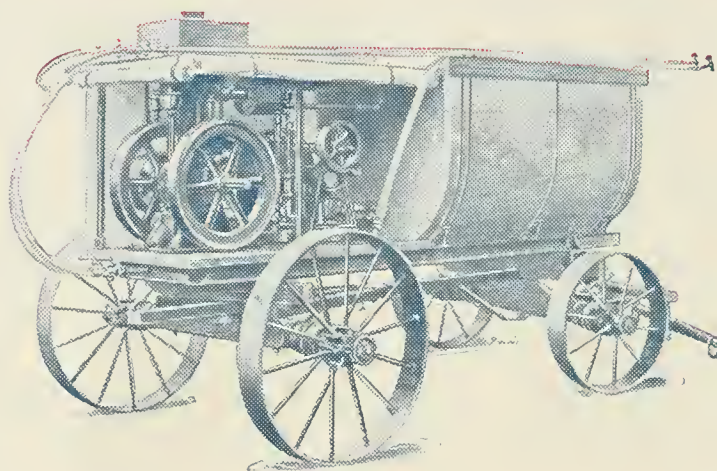
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Our many models enable the orchardist to equip his orchard with the machine meeting his individual requirements in size, construction and price.



The Western Triplex is the all-around sprayer. The detachable truck can be used for general farm purposes as well as on the sprayer. Its ample power and capacity meets the requirements of the largest growers.

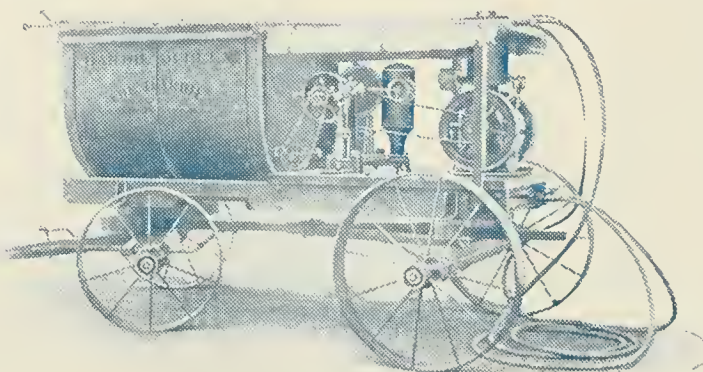
THE WESTERN TRIPLEX

All Hardie Sprayers are made up by specialists who have devoted years to this one line.

To any grower who seeks not only spraying results but economy of operation and upkeep as well, our machines will prove of the greatest interest.

Our line is broad enough to fill every spraying need and specialized enough to fit every individual orchard requirement.

Smaller than our Triplex, it is strongly built and carries the same high quality of design and materials.



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THE HARDIE DUPLEX

On proper spraying much of your profits depend. Now is the time to plan for a better crop for 1916 by writing today for our new catalog which tells the complete story of the

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or prices are too low to yield a profit, there is nothing that can be so surely relied on to "tide you over" as a few good cows, especially if they are fed economically by the use of the

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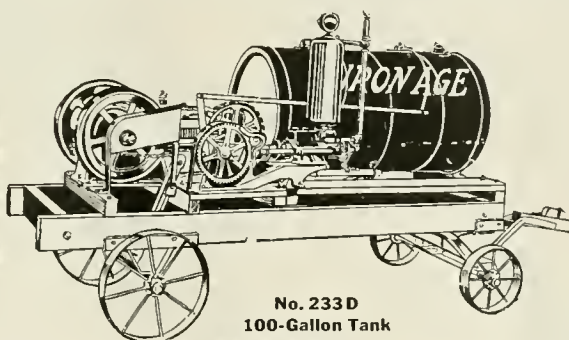
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(INTERNATIONAL RAILWAY JOURNAL)
Philadelphia — February, 1916



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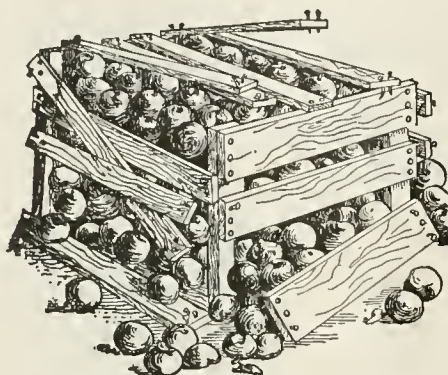
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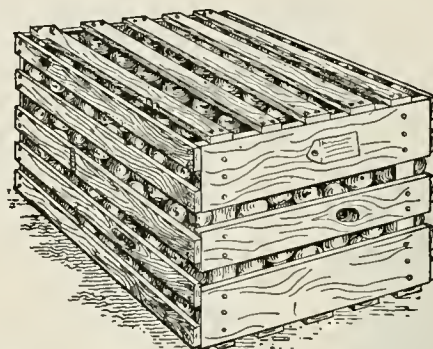
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Buy "Corona Dry"

One pound of "Corona Dry" will do the work of three pounds of Paste Arsenate and do it better

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But economy is not everything. Efficiency is more important. What would it mean to you to have a spray mixture of standard strength and be absolutely sure that all of one spraying or of many sprayings was absolutely the same strength? Evaporation, difficulty of perfect mixing, make this impossible with a paste arsenate. You can have a standard efficiency if you use *Corona Dry*.

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A large practical usage in every section of the country has proved that "Corona Dry" is unequalled in efficiency or as "easy mixing." It does not freeze, dry out or cake; always retains its original strength. A perfect mixture, a perfect standard of unvarying strength is assured with

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Use an extension head disk harrow and liven up every tree.

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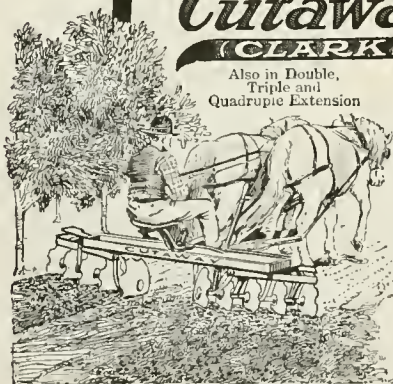
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Combination Spraying for Insect Pests and Fungus

By Paul R. Jones, Manager and Entomologist Insecticide Department, Balfour, Guthrie & Co., San Francisco

THE business of modern fruit growing has become so competitive of recent years that every branch of the industry is now very highly specialized. Probably no other part of the fruit business has made such great strides the last ten years as the scientific treatment of the trees for the control of insect pests and fungous diseases. Not very long ago this phase of fruit growing was very little understood and most of the known insect remedies were hand-picking, lime-sulphur and kerosene emulsion. In fact, some entomologists, who advised the above remedies and no others, were known as "Kerosene Entomologists." With the greatly increased acreage of fruits that has been set out recently, and more discriminating selection by buyers and consumers, it was imperative that the growers themselves understand the control of the troubles which destroy their crops. It is not unusual now to find in any fruit section numbers of fruitgrowers who are able to tell intelligently how to control these pests, and at the same time put their methods in practice in the field. The rise and increase of these different insect pests and fungous diseases, due to many causes, has led to the use of a variety of sprays and it is of the utmost importance that wherever possible the combination of two or more materials, either for different types of insects or for insect pests and fungous troubles, shall be made with the same application, since a great part of the cost of the spraying is due to the labor in applying. This side of applied economic entomology, as related to fruit growing, is probably the most recent of any, and I will now endeavor to show some of the more recent, at the same time older, combinations which may be used in orchard - spraying practice.

The insect which started combination spraying on an extensive scale on the Pacific Coast was the Pear Thrips in California. While this insect is injurious to a number of orchard fruits, it confined most of its attacks to the pear, prune and cherry. The prune growers and cherry growers in California never had done much spraying until the Pear Thrips came along, with the possible exception of some winter treatment such as lime sulphur or crude-oil emulsion. The pear growers had been used to spraying for Codling Moth, Pear Scab, Scale and several minor troubles. On account of the short period in which the Pear Thrips was able to absolutely ruin crops it was necessary for the grower to bend

all his energy toward combating this pest. At the same time it was desirable to try and control other insect and fungous troubles during this application, otherwise more labor would be required for any other spraying and a heavier investment in spraying equipment, and it would not be possible to put on the additional applications for these other insect pests and fungous diseases in time to control them properly. The early investigations for Pear Thrips control were worked out on separate lines of oil emulsions and nicotine compounds, but it was found that the nicotine compounds did not have the required penetration into the fruit buds by themselves, and that the oil emulsions when used at a sufficient killing strength by themselves were liable to cause injury. Hence, the combination of the two was formed. After the petals had fallen it was necessary to spray for the Codling Moth, and arsenate of lead was added to this mixture. One orchard in Santa Clara County was also sprayed for Pear Scab and had the addition of bordeaux mixture to the above combination. A report on this orchard showed later that no injury to the foliage was accomplished, practically no worms were present, the crop was saved from the attacks of the Pear Thrips and no Pear Scab appeared. This orchard was treated several times with the above combination of the four different materials.

The last year or so fruitgrowers on the Sacramento River, where the Pear Thrips is quite prevalent, have been using on pears a combination of miscible oil, Black Leaf 40, arsenate of lead and atomic sulphur, all in the same tank, and obtain perfect results with each material for the purpose for which it was intended. On prunes and plums the arsenate of lead is left out unless the orchard is infested with Canker Worms. It might be well to add here that the miscible oil and Black Leaf 40, or oil emulsions and Black Leaf 40, have given very good control of the Canker Worms in the Santa Clara Valley and elsewhere just after they have hatched from the eggs and at the regular time for the Pear Thrips application. In case this application is put on rather late it is desirable to add arsenate of lead to the above mixture to catch any straggling Canker Worms that may show up. It is often possible in this way to get around using a large amount of arsenate of lead on plum and prune, the foliage of which is very susceptible to injury by this poison. The above combination has also controlled the Prune

Aphis when applied just after the petals have fallen, presumably killing the stem mothers, while applications for the adult thrips was of no avail against this aphis. Still further, in commenting on this combination in spraying prunes, where no Canker Worms or fungus was present, the arsenate of lead and the atomic sulphur were omitted, and it was noticed after the two or three Pear Thrips applications that the Brown Apricot Scale was controlled very well for the year, showing here the accumulative benefit of weak-oil emulsions. It might be well to add here that in this combination of oil emulsions Black Leaf 40 and arsenate of lead, usually no trouble is experienced out in the field, except where very hard water is encountered. Certain sections of California have such notoriously hard water that it is necessary to clean out the spray tank after each load and also use some water softener or an excess of soap with the oil emulsion. Repeated experiments last year showed that where a standard oil emulsion was diluted to a certain strength and Black Leaf 40 added at the regular thrips strength, and also Nicofume 40 added at the same strength in another test tube of diluted emulsion, that the Black Leaf 40 broke down the oil emulsion quite rapidly (this is to say, within a day or so), while the Nicofume 40 in combination with the dilute emulsion remained in solution indefinitely without the slightest bit of separation. The Black Leaf 40 evidently has more of an acid reaction than the Nicofume 40, which is supposed to be free nicotine, hence in very hard water the former will break down oil emulsions, especially if they do not contain a little more emulsifier than is absolutely necessary.

Other combinations that are used in California are crude-oil emulsions and caustic soda, or distillate-oil emulsion and the latter, for clean-up work in the winter on Scale or Moss and Lichens. The writer personally does not like to recommend a very high amount of caustic soda for two reasons: it is apt to break down the emulsions and has a habit of hardening the bark and killing the fruit buds. Even strong alkali-soap solutions added to oil emulsions contain so much caustic that they will either increase the penetration of the oil emulsion to such an extent that either one or both will destroy a large percentage of fruit buds. This was especially noticed last year in a pear orchard where a strong laundry soap was used with home-made distillate-oil emulsion, in com-



FIGURE 53—An old Italian prune tree that has not been pruned for a number of years. The scaffold limbs and lower branches have become barren through the dying off of their fruit spurs. The top of the tree is very thick and bushy and consists mainly in long, slender, weak fruit spurs and fruiting branches, like those shown in Figure 50

parison with a block sprayed with cresol soap and commercial distillate-oil emulsion. The former ruined between 90 and 95 per cent of the fruit buds, whereas the latter did not cause any damage and even stimulated the trees. An excess of caustic in the laundry soap and the amount used was probably responsible for most of the injury.

Bordeaux mixture in combination with resin soap or liquid whale-oil resin soap has been used sometimes on raspberries for Anthracnose, but has not come into general use on fruit trees. However, in certain sections of California, notably the San Joaquin Valley, it was found desirable this year to try liquid whale-oil resin soap with the bordeaux for the control of the shothole fungus, or California Peach Blight, which was very severe on some varieties of shipping plums. Ordinary bordeaux treatments on these orchards, which were irrigated many times during the summer, did not sufficiently control this trouble, and the condition was growing worse every year. However, with the addition of liquid whale-oil resin soap, bordeaux had a much better wetting and sticking power and covered all of the small twigs. It is interesting to note here that, contrary to general opinion (both popular and scientific), it was found possible to spray these plum trees in July with all

strengths of bordeaux ranging from 2½-2½-50 up to 8-8-50, plus 1 gallon of liquid whale-oil resin soap, per 200-gallon tank, under climatic conditions where the temperature ran as high as 110 degrees Fahrenheit, without a sign of injury. This enabled one of the large growers to get over his ranch quite easily before the winter rains began, and to get at the Shothole Fungus early, before it had injured the fruit buds for the coming year.

Miscible oils in combination with bordeaux mixture was also used this summer, both on deciduous and citrus trees, without the oils or bordeaux breaking down and without causing any injury to the foliage, fruit or trees. It must be stated here, however, that this work was only of an experimental and demonstrative nature and has not been done in any commercial way. To make this mixture a success it would be necessary to have a good miscible oil and also to be absolutely accurate in making the bordeaux mixture. The manner of using this combination was as follows: Make up the bordeaux mixture in the regular way and fill up the sprayer tank with water, then add the miscible oil which has previously been thinned to a thin cream. If there is any trouble with either mixture breaking down, a half gallon of liquid whale-oil soap should set everything right, and it is possible that this much soap

will have to be used in sections where very hard water is present. Prepared bordeaux paste did not work with miscible oil successfully on account of not having an excess of lime present, and a copper soap was formed. It is quite possible that this bordeaux miscible-oil combination will be worked out to be used in the Northwest soon where it is desirable to control Shothole Fungus and Scale insects with one application. But the grower should bear in mind that this should not be attempted in a commercial way at present, until more work has been done by the investigators.

Mr. Yothers in his work in Florida showed the practicability of using miscible oils in combination with soda-sulphur solutions for the Scale insects and Red Spider, and the writer expects to try these out fully the coming year under Western conditions, both on citrus trees and deciduous trees. It should be noted here in using the bordeaux and miscible oils, and also whale-oil soap, that while the home-made bordeaux worked perfectly, trouble was experienced with prepared bordeaux paste in that no excess lime was present and a copper soap was formed, which came to the top of the tank and made it difficult to force through the nozzles. Too much lime would form a lime soap. This difficulty could probably be overcome with the addition of a slight amount of caustic soda placed in the diluted miscible oils before adding it to the tank.

In the apple section of Pajaro Valley, where Mildew is quite prevalent, the combinations of arsenate of lead and atomic sulphur are quite common, the former for Codling Moth and the latter for the Mildew.

It is in this section also where lime-sulphur solution is combined with nitrate of soda, the former for its regular use and the latter for stimulation.

On grape vines in California where it is necessary to combat the Mildew and at the same time the Grape-Leaf Hopper, Black Leaf 40 is used with atomic sulphur in the second application. The first application of atomic sulphur is usually made when the growth is about 9 to 18 inches long; the second one in combination with Black Leaf 40 after the berries have set and are about the size of buckshot.

The past year or so the Cottony-Cushion Scale which at one time threatened to destroy the citrus fruit industry of California, and which presented a unique case in insect parasitism in that it was practically exterminated by the *Novius (Vedalia) Cardinalis*, has been developing to quite an extent as a pear pest. Strange to say, this Scale only appears on the Winter Nelis variety with maybe a few scattering individuals on the Buerre Hardy. The *Vedalia* does not seem to control this scale at all on pears, although many attempts have been made to make it to work properly. The continuous spraying with arsenicals probably forces enough of the poison into the cottony mass to poison the lady

bugs, or at least make it distasteful for them. At any event the Vedalia did not control this insect and it was necessary to devise some means of artificial control. Spraying with oil emulsions and using crude oil as high as 35 to 40 gallons per 200-gallon tank failed to control this insect, and the pears were sticky and smutty by picking time, due to the work. Experiments last year showed that a miscible oil, used about 12 gallons per 200-gallon tank in combination with several gallons of cresol soap (extra) to increase the wetting power and penetration, controlled this insect admirably and succeeded in killing most all of the eggs. In addition to this the treatment stimulated the trees very materially, and they came out in bloom ten or fourteen days ahead of unsprayed trees, and set a much heavier crop. Laundry soap applications in combination with home-made distillate-oil emulsion killed the scale quite readily, but the fruit buds also, and was abandoned by the owner of the orchard in favor of the miscible oil and cresol-soap combination. This combination, or one such as miscible oil in combination with liquid whale-oil soap, could probably be adjusted and used to advantage in the Northwest for fall applications of the Woolly Aphis, and also for Scale insects where great wetting power and penetration is desirable without increasing the oil content very materially. In fact the oil content can be cut down below normal for these fall applications after the extra soap is added.

Lime-sulphur solution and Black Leaf 40 have been used to advantage in the Northwest and elsewhere for scale, fungus and aphids. Wilson, in "Biennial Crop Pest and Horticulture Report" for 1913, recommends combination of lime sulphur 1-10, plus Black Leaf 40, 1-900, just after the fruit buds open to destroy the Aphis stem mothers. This also has the advantage of being a scalecide.

It is often necessary to know what mixtures do not combine. Never mix

lime-sulphur solution with bordeaux, nor use lime-sulphur solution with any oil emulsion. In the latter case oil emulsion is broken down by the action of the lime, which forms a calcium soap and free oil results, which will cause injury. Neither is it possible to mix lime sulphur, oil emulsion and arsenate of lead together. Never mix home-made lime sulphur and salt with arsenate of lead, but the commercial lime-sulphur solution can be and is

used quite extensively with the lead. Sometimes, however, an improperly balanced lead containing free arsenic will form a black precipitate (lead sulphide) when mixed with the lime-sulphur solution. Tri-plumbic arsenate of lead does not cause this to so great an extent as the standard lead. Black Leaf 40 can be used with a good bordeaux mixture, but do not combine free nicotine such as Nicofume 40 with bordeaux.



FIGURE 54—The same tree shown in Figure 53 after pruning. Pruning has consisted mainly in the removal of dead branches and dead fruit spurs and a rather severe thinning out of the remaining live ones

Pruning the Bearing Prune Tree

By Professor V. R. Gardner, Oregon Agricultural College, Corvallis

[NOTE—Illustrations 49 to 52, inclusive, in connection with this article appeared in the February edition of "Better Fruit."]

UNTIL the prune tree reaches bearing age there seems to be very little need for training or pruning it in a way different from that commonly employed with the apple or pear. The aim in each case is to develop quickly a good, strong framework to support the fruiting wood and the fruit crops of later years. When the time comes, however, to bring the tree into bearing its pruning should be somewhat different from that of the pomaceous fruits, for it has a fruiting habit that is quite distinct from theirs.

How the Fruit-Spurs of the Prune Are Formed

In order to explain why certain pruning practices are desirable with the prune, it is necessary that there

first be a correct understanding of its fruiting habits. Accordingly at this point it will be well to consider how and where the fruit-spurs of the prune tree are formed. A well-grown prune tree four or five years old will have, before its winter pruning, from ten to twenty-five or thirty strong, vigorous shoots of the past season's growth. These will vary in length from eight or ten to fifty or sixty inches. Some spring from three or four-year-old wood, or even from the main trunk. Most of them, however, spring from last year's branches. As a rule trees of the age indicated possess more shoots than it seems desirable to retain, and it is generally considered good practice to remove some of them. We will assume that this is done and

that, in accordance with the common practice, most of those that are to remain are headed back moderately. When growth begins in the spring the terminal buds of all the unheaded shoots are almost certain to start to vegetate and from them are produced new shoots, thus increasing the spread and height of the tree. In the case of the headed shoots, usually several of the lateral buds near the end start to develop new shoots that increase the height and spread of the tree in the same way as shoots from terminal buds. But it is not only terminal buds and a few lateral buds near the upper end of last year's shoots that start in the spring. A great many of the lateral buds start, though generally it is only a few of the more favorably placed ones



FIGURE 55—An old Italian prune tree that one year ago was in much the same condition as that shown in Figure 53. At that time it was pruned in the same manner as the tree shown in Figure 54. Note the increased vigor and stockiness of the old fruiting branches and fruit spurs, and the watersprouts springing from the scaffold limbs. Good fruiting wood can be developed easily from these watersprouts.

near the ends of last year's growth, or near the end of what is left of it after the winter's pruning, that are able to develop new shoots. From the other buds are produced only short branches, which, because of their position, the shortness of their internodes (closeness of their joints) and their subsequent behavior, we call spurs. These spurs may become several inches long the first season, though as a rule they are much shorter.

If these spurs are examined during the growing season they will be found to possess several leaves apiece, and in the axil of each leaf is a bud. Their leaves are of normal size, and the buds in the axils of these leaves are of normal appearance. The only difference between the spur and the ordinary leafy shoot apparently is in length. However, examination of one of these spurs during the dormant period will show that some of its buds are leaf-buds and some are flower-buds. Invariably its terminal bud is a leaf-bud. Some of its lateral buds are likely to be leaf-buds, but a large proportion of them are flower-buds. Here, then, is the mechanism by means of which the prune tree bears its fruit. It occurs as a short branch, lateral to the main direction of growth of the limb from which it springs, and terminating in a leaf-bud. The flower-buds themselves are lateral, being borne singly in the axils of the

leaves. When the leaves are very close together, the internodes being very short, the flower-buds may seem to be clustered, but an examination of the spur during the summer shows that each bud is subtended by a leaf. It will thus be seen that the fruit of the prune is borne laterally on spurs.

It should be explained here that this is intended as a description of only the ordinary fruiting habit of the prune. Some varieties frequently show some variation from this method of fruit-bearing. Especially is this true of young trees growing vigorously and of watersprouts on older trees. With them there is a tendency to produce lateral fruit-buds near the base of the new shoots, and at the sides of the regular axillary leaf-buds, after the manner of the peach. However, these are to be regarded as rather special, though not abnormal, cases. The majority of prunes are borne on spurs.

How the Fruit-Spur Grows From Year to Year

Since the fruit-spur of the prune terminates in a leaf-bud that starts to vegetate about the same time that its lateral flower-buds open, the spur increases in length at the same time that it is producing fruit. By the end of the second season it consists of an older portion that has borne fruit, and of a newer portion that possesses a terminal

leaf-bud and a number of lateral flower and leaf-buds, these lateral buds having been borne in the axils of the leaves of the preceding season. The fruit-spur is thus ready to bear fruit again the following year. Under normal conditions it may be expected to fruit and elongate during the third and fourth and during succeeding years, in the same way it fruited and increased in length during the second season. A fruit-spur, once formed, tends to live a good many years. So far as we know, there is no factor connected with its manner of growth to set a definite limit to its age. It is possible that as it becomes older it loses some of its vigor and finally becomes unable to produce good fruit. To prolong the life of the individual fruit-spur, or more accurately, the period during which it is capable of producing good fruit, should be one of the main objects of pruning practice. The prune orchard is maintained for the prunes it will produce, and if a very large percentage of its fruit is borne upon fruit-spurs their number and productiveness should be studied with reference to every orchard operation, and particularly with reference to pruning, for obviously the various pruning practices directly effect them.

The Difference Between Good and Poor Fruit-Spurs

In describing the manner of growth of the fruit-spur of the prune, one important characteristic was not noted. It is that the portion of the spur that bears fruit any one season produces only very small leaves during that season and no leaves at all during succeeding seasons. The only part of the individual fruit-spur producing leaves during any summer is the new portion developing from the bud that terminated last season's growth. This is because the flower-buds of the prune are practically flower-buds only, and not mixed buds like those of the apple and pear. As the spur elongates year after year, it comes to consist of a long barren basal portion and a short terminal productive and growing portion. Examination of the fruit-spur system in almost any old prune tree will disclose many fruit-spurs that have become very long, slender and willowy. It is not uncommon to find individual spurs eighteen or twenty inches long, only the terminal one or two inches of which produce leaves and fruit and possess fruit-buds and leaf-buds for the following season. In the same tree will be found short, stocky spurs, sometimes not more than one or two inches long. It hardly need be pointed out that of the two kinds the latter are greatly to be preferred. They usually average more fruit to the spur, hold their fruits from being blown about so much by the wind, keep them from becoming limb-rubbed, and are themselves less subject to accident. In fact, it is the long slender spurs that are usually the first to become weak, produce smaller fruits, and finally die. It may almost be said that a marked lengthening of the spur instead of its remaining short and stocky is a sign of weakened vitality, the first indication

of approaching death. Though generally weaker, the long, slender spurs are by no means always older than the shorter ones. Stockiness or slenderness of spurs in the prune tree is very largely dependent upon the light received by individual spurs. An abundant light supply permits the elongated spur to develop a good, well-lighted leaf system with short internodes (joints close together). A poor light supply forces the spurs to grow out long and slender in order properly to expose their leaf surface. This is probably the main reason why the spurs in the very top of the tree average much shorter and stockier than those in the interior of the tree.

The Ideal Distribution of Fruit-Spurs in the Prune Tree

We want not only a large number of short, vigorous fruit-spurs in the prune tree, but it is desirable that those spurs be well distributed. A good distribution of fruit-spurs means having a considerable amount of small fruiting branches in the lower part of the tree and not having them all crowded together in its upper and outer portion. The trees of many bearing prune orchards consist mainly of barren scaffold limbs, terminating in large numbers of small spur-bearing branches that occupy a comparatively narrow space around the outside and that quite completely shade the interior. In these trees the load of fruit is borne at a considerable distance from the main trunk, thereby placing the greatest possible strain upon the scaffold limbs and crotches. Were this load more evenly distributed over the scaffold limbs, as it would be if there was fruiting wood in the lower and interior portion of the tree, there would be much less breaking of limbs and splitting at the crotches than we now find in our prune orchards.

The same factor, limited light supply, that causes individual fruit-spurs to become weak and finally die, acts in the same way upon fruiting branches. It first forces them to grow long and slender in order to reach up to the light. Finally finding themselves out-distanced in the struggle for existence, these branches die off and the scaffold limbs are left with longer and longer barren stretches.

Pruning That Keeps Individual Fruit-Spurs Stocky and Well Distributed

It will be inferred from the statements that have been made that the most important thing to do in pruning the bearing prune tree is to thin it sufficiently to admit an abundant light supply to the small fruiting branches and to the individual fruit-spurs. There is certainly good reason to believe that this practice is one that most closely harmonizes with and tends to improve its natural fruiting habits. This is far from stating that prune trees should never be headed back. Without doubt, the strong vegetative shoots that frequently appear even in old trees should be judiciously headed back. Likewise, individual fruit-spurs can often be headed back to a lateral branch of the

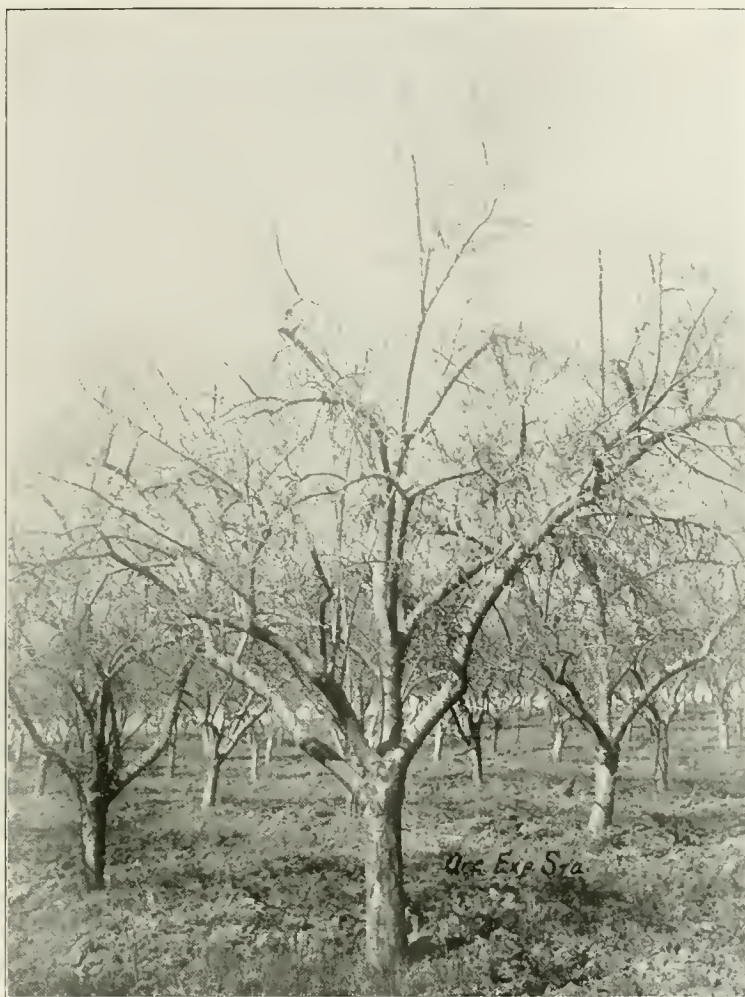


FIGURE 56—An old Italian prune tree that two years ago was in much the same condition as that shown in Figure 53. At that time it was pruned in the same manner as the tree shown in Figure 51. Note that not only have the old fruiting branches and their fruit spurs been invigorated and made more stocky, but a considerable amount of new fruiting wood has been developed. Renovation can hardly be said to be complete, but considerable progress has been made in that direction, and that without sacrificing a single fruit crop.

same spur and thus be made more stocky, rather long, slender fruiting limbs may be cut back to make them more stocky. Nevertheless, it would seem that a large part of the pruning of the bearing prune tree should be a judicious thinning out of the smaller branches (branches half an inch or less

in diameter). This necessarily involves the removal of a certain amount of bearing wood; but if the amount removed is not too great, the loss will be more than compensated by the increased stockiness and vigor of the remaining fruit-spurs, and by the increased size of the fruits that they bear.

Powdery Mildew of Apples

[Washington State Agricultural Experiment Station Bulletin]

THE powdery mildew of apple is due to the parasitic fungus, *Podosphaera leucotricha*, the vegetative body or mycelium of which develops as a coating of minute interlacing whitish filaments on the parts of the plants attacked. The fungus produces two spore stages in its life history: the conidial or summer spores which are produced throughout the growing season and give to affected parts a whitish powdery appearance; the ascigerous stage, which gives rise to the ascospores. The latter is produced only upon the twigs, and the bodies bearing the ascospores may be found buried in the dark-felted mycelial mass toward

the end of the growing season. The conidia serve to spread the fungus during the growing season. It is apparent that the fungus is carried over the winter by mycelium which hibernates in the buds and also by the ascospores. The part which the latter play in the life history of the fungus is somewhat problematical. The mildew confines its attacks in the main to young shoots and blossom clusters. Both stem and leaves of shoots may be affected and either killed, deformed or reduced in size and vigor. Blossom clusters may be blighted and young fruits may be affected later than at the blossoming period. The mildew is



FIGURE 57—An old Italian prune tree that four years ago was "dehorned" for purposes of renovation. Since that "dehorning" little or no pruning has been done. Last year the tree bore a small crop of prunes on spurs that developed on the watersprouts stimulated by the "dehorning." There is promise of a medium crop this year, but the newly-formed spurs in the lower part of the tree are already showing signs of weakened vigor because of too much shading. To keep them from becoming long and willowy and finally dying, considerable thinning out is necessary. Heading back, which would stimulate the formation of more watersprouts, would increase the trouble. This figure and its explanation should be compared with Figures 53-56 and the explanations accompanying them

known on the fruits of pear also. The amount of blighting of blossoms varies in different localities. Secondary infections may occur on mature leaves to a limited extent.

The control of the disease calls for the employment of two methods, (1) pruning and (2) the application of fungicides. In light attacks of mildew it seems probable that pruning alone will suffice, while in orchards where the disease has gained considerable headway spraying must be resorted to in addition to the pruning. (1) Pruning. It is known that infested buds on badly-mildewed shoots produce seriously-diseased shoots the following spring. Spraying will not prevent these infections, so the affected shoots should be removed and destroyed by burning. This may be done at any time consistent with horticultural practice, and if not done earlier should be made a part of the regular dormant pruning operations. If mildew is serious it will be advisable to prune out more brush than

ordinary to stimulate the growth the following season. In general, the pruning practice should aim to eliminate close interlacing of branches and vigorous shoots of the current year's growth should be cut back one-third to one-half. (2) Spraying. The time of application of the spray may be given first consideration. It has been demonstrated that winter spraying is without effect on mildew in California. It has not yet been determined whether this holds for Washington conditions or not, but it is probable that such will be the case. The times of spraying to be recommended are as follows: (a) Just after the petals fall. (b) In connection with the second spraying for codling moth or earlier if the mildew is serious. (c) Three or four weeks after the second spraying. It may be necessary to spray a fourth time after a like interval if mildew is serious and conditions continue favorable.

The selection of the fungicide is a matter of considerable importance and

should depend in part at least upon what other diseases are present in an orchard. In some sections of Washington powdery mildew is the only fungous disease of apples that is present, but in others the orchard must be protected from scab also. In case scab is present the regular lime-sulphur treatment (1-30) for this disease should prove of value in the control of mildew. The number of sprayings for scab will vary according to conditions and the severity of the disease. Those most generally recommended are as follows: (1) Just as the blossom buds separate and show pink. (2) Just after the petals fall. (3) Ten days to two weeks later. Experience will show whether the first only or all of these applications are necessary. If the mildew is bad additional sprayings may be necessary for this disease alone, and in this case it may be advisable to employ one of the sulphur sprays recommended below.

If powdery mildew is the only disease for which protection is sought one of the following fungicides may be used: (1) Atomic sulphur or some other finely divided form of sulphur. Atomic sulphur may be used at the rate of 2-6 pounds to each 50 gallons of water. It seems probable that the minimum strength recommended will give as effective protection as the more concentrated solutions. (2) The iron-sulphide mixture. The rather laborious method described in the reference given below does not seem to be necessary, at least for the drier sections of Washington. The modified Ballard formula is as follows. Iron sulphate (copperas), 4 pounds; lime-sulphur, 33 degrees Beaume, 1 gallon; water, 200 gallons. A stock solution of the iron sulphate should be made and one pound to the gallon is a convenient strength. Fill the sprayer tank, start the agitator, add the lime-sulphur and slowly add the requisite amount of iron-sulphate solution. In order to insure complete precipitation of the iron sulphide a slight excess of lime-sulphur may be used. The necessary insecticides like Black Leaf 40 or lead arsenate may be added to either the atomic sulphur or the iron sulphide mixture.

[Editor's note—Hood River growers found modified formula unsatisfactory; now use precipitating method.]

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The English Walnut Culture in the Pacific Northwest

By A. A. Quarnberg, Vancouver, Washington

THE English or Persian Walnut is a thrifty, fine-growing tree with clean light-gray body, symmetrical head and dark-green foliage, and under favorable soil and climatic conditions attains great size and long life. While being decidedly ornamental and filling the requirements for a first-class shade tree, it is planted chiefly for its valuable nuts, and, where it succeeds well, its culture should take a prominent place among the industries of the country. English Walnuts are a nutritious and wholesome food, and while formerly used mainly for dessert and confectionery purposes, they are now fast coming in favor as a regular article of diet and more used in many substantial table preparations. They may also be converted into a valuable oil used both as a food and a medicine, and immature walnuts, when tender and entirely free from woodiness, may be used for pickles, catsups, etc. By reason of the many uses of walnuts their consumption in the United States has increased more rapidly than the production, and with the present heavy importations there is but little danger of overproduction for some time to come. We are just at the beginning of successful walnut culture in the Northwest; some progress has been made, but there is much yet to learn. However, enough has been done to prove beyond a doubt that walnut growing here offers great opportunities for the future. With thousands of acres of land with soil and climatic conditions suitable for walnut growing, we certainly should produce not only all the nuts consumed at home, but large quantities to ship to other less-favored localities as well.

While experience has shown that under proper conditions the walnut will grow and bear in the Northwest so as to justify its planting, it must be remembered that walnuts cannot be set out anywhere and of any variety with assurance of success. Thousands of dollars have undoubtedly already been wrongfully expended in walnut planting on the northern Pacific Coast, resulting in many failures and disappointments which could have been avoided by careful and intelligent selection of lands and varieties for planting. The first and most vital requisite for success in walnut growing is land with the proper soil and exposure; then the selection of good blight-resistant varieties well suited to the locality, and, lastly, good care. Walnuts require deep, rich soil, the deeper and richer the better; in other words, they require soils well supplied with plant food and plenty depth to retain the necessary moisture during the dry season, yet, at the same time, well drained and free from standing water. Walnut trees cannot resist sour, seepy soils, nor can they be expected to do much or resist the blight successfully on coarse, sandy, shallow and poorly-watered

lands without plenty of fertilizers and irrigation. Furthermore, the success of walnuts planted in a frosty locality, even with good soil, is very doubtful. Without good care of the trees the planter is surely doomed to disappointment.

There are mainly two distinct strains of walnuts grown on the Pacific Coast, the Santa Barbara Soft Shell types and the French varieties. The Santa Barbara types, while being vigorous and strong growers, bud out early in the spring, are liable to injury by spring frosts and blight, and, generally speaking, do not succeed well in the Northwest. But the French varieties, which begin their activities later in the season, have shown themselves well suited to the country's condition, and have practically demonstrated the possibilities of commercial walnut growing in the Pacific Northwest.

Grafted trees bearing high-grade nuts are to be preferred for planting on account of the uniformity of the product. While there are some fine and valuable second-generation seedling trees, these seedlings have not proven entirely satisfactory, as they are sometimes found to vary in growth and productiveness and their nuts often differ

in size, shape and flavor. If seedlings are planted they should be propagated from nuts carefully selected in every respect. Grafted trees should have select stock, not only for the top but for the root as well, for upon the root depends in a large measure the life and value of a tree. Good results have been obtained from grafts on Northern Californian black, and Eastern black-walnut roots, as well as from strong roots of the English varieties and certain hybrids; but, while it cannot be expected that any one root will be the best under all conditions, the Northern California black is now quite generally considered to be one of the best average root stock for English walnut trees in the Northwest.

The commercial value of a walnut tree depends upon its growth and productiveness and the size, shape, color, smoothness, sealing and self-hulling quality of the nut and flavor, size, plumpness and color of the kernel. The old French varieties such as Franquette, Parisienne, Mayette, Meylan and others, possessing in a high degree the qualities which make good commercial nuts, at present are, and will probably continue to be, the standard selection for planting in the Northwest unless



FIGURE 58 An old Italian prune tree that four years ago was partially "dehorned." Note that the treatment apparently had little influence upon the vigor of the small fruiting branches and individual fruit spurs of the limb not cut back



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some new variety particularly adapted to the existing conditions and requirements should develop. At present, the Franquette seems to be the most popular and probably is one of the best, if not the best, varieties to plant. While it appears that good crops may generally be secured from the planting of the Franquette entirely, I am sure that they would be benefited by proper cross-fertilization, and until the fertilizing characteristics of our standard walnuts are more definitely known it seems to me that some intermingling of varieties which blossom at the same time would be safer and at least tend to better fertilization, and consequently larger and better crops of nuts. In California several new varieties of reasonably well-established merits such as the Concord, Wiltz-Mayette, Eurica and others have of late been planted quite extensively, and some of them are also now being tried in the Northwest with promising results.

Under favorable conditions the English walnut trees attain great size, and therefore should not be planted less than fifty feet apart; on good land sixty feet is not too much for perfect development of the trees when nearing mature age. In urging a good distance between walnut trees and to show how necessary it is to have plenty of space, the great growth of three old European trees and one in Clarke County, Washington, may be cited. The Beachemwell tree in England had a height of 90 feet; spread, 120 feet; diameter of trunk, nearly 10 feet, and a yield of 1000 pounds of nuts a season. A tree in France lived to be at least 300 years old; had a spread of 125 feet; trunk 14 feet, and yielded 1500 pounds a season. The giant walnut tree in Crimea reached the age of 1000 years and for a long time yielded about a ton of nuts

annually. The walnut tree on the Resch place, about three miles north of Vancouver, Washington, now 32 years of age, has a trunk of eight feet in circumference; height, 52 feet; spread, 73 feet, and this season bore 350 pounds of nuts.

With walnut trees planted the proper distance apart, many consider clean cultivation a waste of land while trees are young, and others must get something from the land for living until the trees come into bearing, and therefore it often becomes desirable to interplant walnuts with other quick-maturing fruit trees as fillers, or to grow hoed or cultivated crops in the wide spaces between the rows. Such interplanting I do not consider especially objectionable, provided the fillers are removed when the walnut trees require the land, and the hoed or cultivated crops are not planted close enough to rob the walnut trees of their necessary moisture and plant food.

For best results the utmost care should be taken in the planting of walnut trees, and the less exposure, mutilation and injury to the roots in transplanting the better it is for the tree. When the land has been staked off, large holes should be dug to give the roots plenty of room and thereby facilitate their rapid development. For this purpose it is a very good plan to blast the holes with dynamite, especially when there is a layer of subsoil too hard for the roots to penetrate, or even check them in their downward growth, which in most cases seems essential to the best development of the walnut. This blasting should preferably be done in the autumn while the soil is dry, and is undoubtedly inexpensive and effective, as one stick of dynamite placed three or four feet deep will crack up and loosen hard subsoils

for several feet around. One way to make holes for the dynamite is to drive a crowbar into the ground; but probably a better way is to use a soil auger, which readily bores through even the harder subsoils. In planting the trees the ends of the roots should be trimmed with a knife by smooth, slanting cuts, and the best soil should be carefully and firmly packed around the roots and also used as much as possible in filling the holes.

Young walnut trees require and respond to good care by vigorous and rapid growth, and unless the land is very rich it will pay to stimulate them with barnyard manure or other fertilizers. Walnut trees are gross feeders and will readily take up almost any fertilizer, and can hardly be overfertilized. Most young rapid-growing walnut trees require staking, and often it is necessary to train and tie up some branches to proper shape. They should be headed about five or six feet from the ground and for the first few years require attention to give the head the proper form, but after that need but little in the way of actual pruning.

Seedling walnut trees are somewhat slow in coming into bearing, but the generally accepted idea that the walnut is normally very late in bearing is not entirely true, as grafted trees usually have a few scattered nuts three and four years from planting, and sometimes even sooner, and increasing annually thereafter with the age and size of the tree. It is reasonable to estimate that a good fifteen-year-old tree will produce on an average from forty to fifty pounds of cured nuts a year; and, in favorable localities, crops, though some may be heavier than others, may be expected and reasonably depended upon every year. While the returns per acre from a walnut grove may not be so large or so soon realized as with some other fruits, it is on the increase almost indefinitely, and a staple price for walnuts is easier to maintain than with more perishable crops.

Walnut trees are comparatively free from insect pests, and aside from the walnut blight no serious disease has yet attacked the walnut. No variety can be said to be entirely free from blight, but the disease varies greatly with different varieties and different seasons. As yet no specific remedy has been discovered; the only solution to the blight problem now seems to be to keep the trees in good, healthy condition, and to grow the most blight-resistant varieties, with which the chances for loss will probably be no more than with other varieties of fruit.

In the Willamette and the Columbia River Valleys walnuts usually mature and begin to drop about the last week in September, and most of the crop is generally harvested the first two weeks in October, so that by the middle of that month the walnut harvest is completed. As the nuts mature the hulls crack open and the nuts usually roll out clean and drop to the ground or are dislodged by shaking the trees.

They are then picked from the ground at least once a week during harvest time, and three or four pickings are generally necessary to gather the crop. When gathered the nuts are thoroughly washed in water and spread on trays to be dried in the sun or in a fruit dryer. In the sun, walnuts will cure in about three or four days' time; if left out over night the nuts should be protected from dews.

Walnuts are one of the few crops which is rather benefited than damaged by rain during harvest time, provided the nuts are not allowed to remain on the ground long enough to mildew and discolor. In wet weather walnuts must be dried in well-ventilated dryers with heat from 80 to 90 degrees Fahrenheit; high heat will start the oil and injure the meat and flavor of the nuts. Good nuts may be spoiled in drying, and proper curing is an important part of walnut growing. Thus far Northwestern-grown walnuts have been sold without any kind of bleaching; most of the French varieties do not really have to be bleached to sell readily on the market. After the nuts have been properly cured, the test of which is a brittle meat, they are assorted and graded ready for packing and marketing. It is a singular fact that the Northwestern-grown walnuts are usually cured and ready for the market about the same time as the Santa Barbara Soft Shells are in Southern California.

In conclusion, it should be said that the walnut should appeal not only to the orchardist, but to the general farmer and town-lot owner as well, and all should have a few trees where they will grow. The culture of English walnuts is attractive in many respects; they are a reasonably sure crop; they do not require an immediate market; they are well known, and there is always a demand for them at fair prices. The trees are out of the ordinary in that they combine the ornamental, the useful and the profitable in the highest degree possible. Thrifty English walnut trees with their handsome dark-green foliage and crop of nuts certainly are beautiful, and give us pleasure, profit and satisfaction; and then, too, they are something permanent and will live and maintain their beauty and productiveness almost indefinitely.

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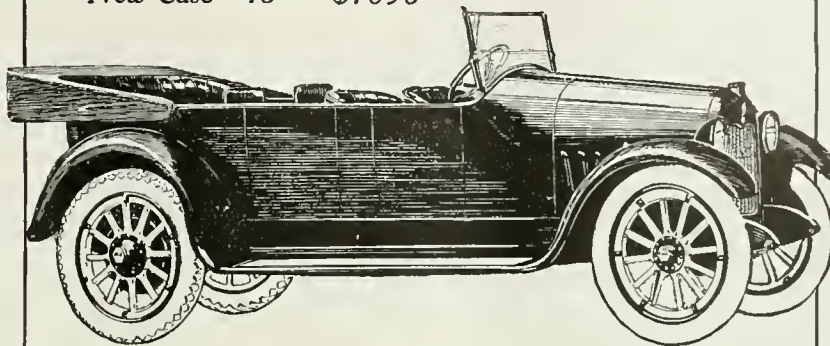
It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the best By-Product machine ever devised. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

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(366)

Peculiarities of the Destructive Plant Lice, or Aphids

By Dr. A. L. Melander, Professor of Entomology, Washington State College, Pullman

DESTRUCTIVE though they are, the Plant Lice, or Aphids, show so many peculiarities in the course of their lives that we cannot help but marvel at their nature. Throughout the summer generation after generation is born alive from virgin females. To the student of heredity this phenomenon is more than interesting, for the successive generations are often widely unlike. Sometimes winged individuals are born of wingless mothers, and they in turn produce wingless offspring. Sometimes the color differs, sometimes the structure. From a practical standpoint the aphids are further remarkable in that some species change their diet during this alternation of generations, the summer broods acquiring food habits totally different from those for the remainder of the year.

Aphids breed rapidly. In a few weeks they are mature and then, except for the sexed final generation of the year, they reproduce living young without the necessity of mating and fertilization. This rapidity of development explains why aphids frequently become abundant to excess despite the usual sprayings. Huxley, the English scientist, once calculated that were a single plant louse to reproduce her full number of offspring and were they and all their descendants to live to old

age the amount of aphids resulting in one season would weigh ten billion pounds. This has been translated as about equivalent to the weight of the entire population of the United States. That such staggering amounts of plant lice fail to appear is due to unnatural death, coming not only through the agency of tiny wasp parasites, of lady-bird beetles or of *Syrphus* fly maggots, all of which greedily prey on plant lice, but also through such causes as wind and rain. However, it is sufficient to say that aphids are prolific.

The curious alternation of generations that occurs through the year can be illustrated by the life cycle of the Green Apple Aphis. The winter eggs, which are commonly located on the exposed bark of watersprouts and of the new growth, hatch when the buds are swelling. The tiny emerging lice are rather dark green in color and soon work into the opening buds. These individuals are all females, but are capable of reproducing the species by themselves, a phenomenon known as parthenogenesis, which is a Greek word meaning "virgin's birth." They are all wingless when mature, never lay eggs, but bring forth from three to twelve living young a day. When about a hundred young have been born the stem mother dies.

The lice of the second generation are paler in color than their parent. They, too, are parthenogenetic, viviparous females, and except for a rare individual now and then are likewise devoid of wings. Their offspring, the third generation, usually develop wings,

in which case they pass during their growth through a sort of pupa stage characterized by the possession of small wing-pads. This generation, whether winged or not, still comprises parthenogenetic, viviparous females. Winged individuals appear in diminishing numbers after midsummer. Their purpose in life is obviously to spread the species from tree to tree, and hence they are called "migrants."

The Green Apple Aphis spends its entire existence on apple trees, or more rarely on pear, hawthorn, quince or flowering crab. In the late fall some small lice are born, of a more yellowish color than the summer generations. These are the wingless males and females, the only sexed individuals of the year. After mating the males perish, while the females crawl out on the twigs to deposit their single egg and to die. Thus are produced the only eggs of the year whose dormancy exhibits Nature's splendid adaptation to tide a delicate insect through the rigors of winter.

Closely related to the Green Apple Aphis is the Rosy Apple Aphis. Like the other, this species also lives in the leaves, causing them to curl by injecting a poison into the growing leaf-tissue, but unlike the Green Aphis the Rosy Aphis confines its attacks mainly to the leaves around blossom clusters. The poison injected is very subtle and affects the young fruit, inhibiting its growth so that the tree develops a crop of "gall-apples." This stunted fruit varies in size according to the extent

Continued on page 41

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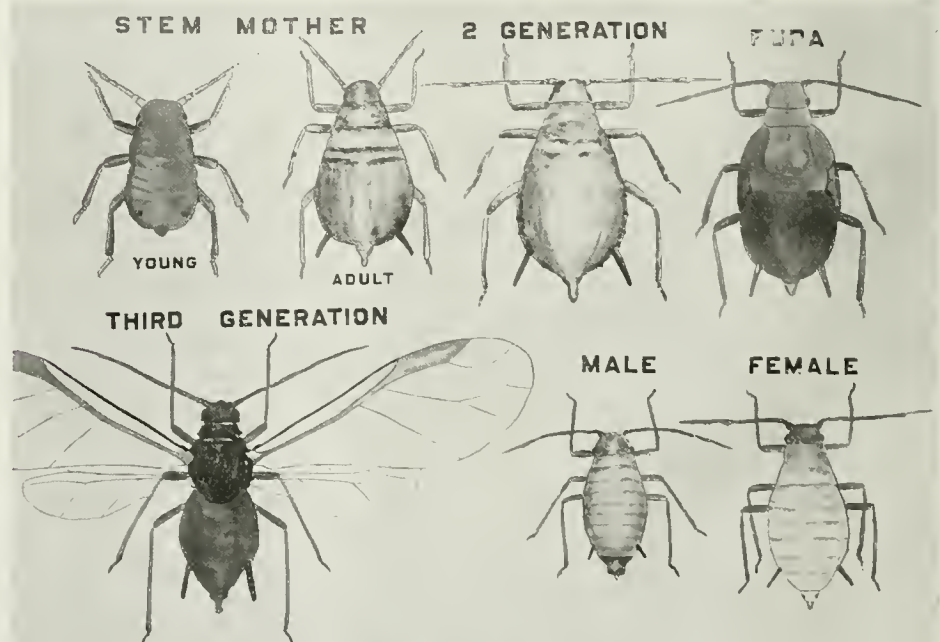
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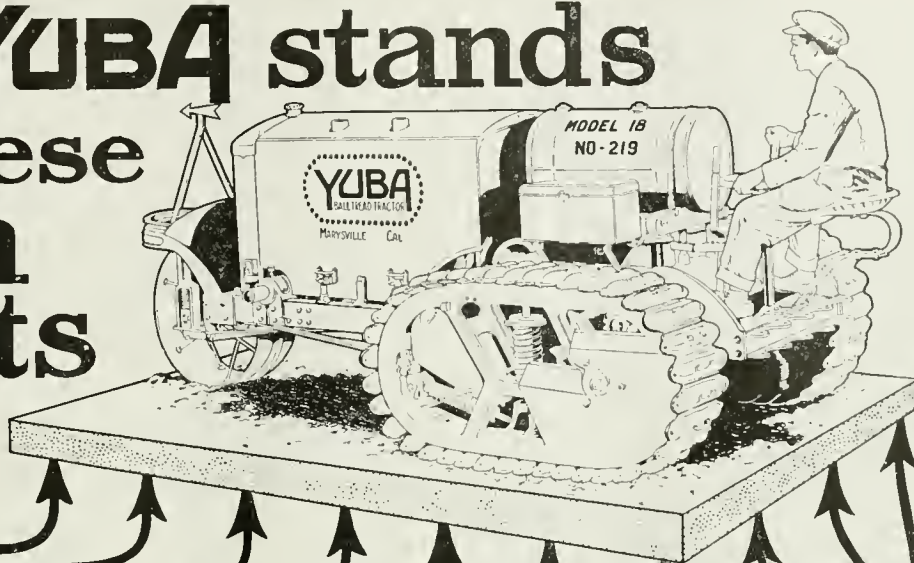
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Fruit Growers' Agency Incorporated

PRACTICALLY all growers' selling agencies in the Northwest have been brought together in a definite, harmonious plan of marketing procedure; all the past hopes and efforts of the growers for an ideal marketing system bid fair to be successfully consummated; all the repeated suggestions and advices of the business men, bankers, the press and others vitally interested in the welfare of the fruit industry to "get together" have been heeded. Briefly, this sums up the effect of the formation of the Fruit Growers' Agency at Spokane last Friday, after more than a year's

careful and incessant thought on the part of the growers, the selling agencies, and particularly the effective investigations and work of the United States Department of Agriculture. To place the fruit business upon a firm, sound basis was the object.

The movement does not mean a new selling organization. It does not mean a new shipping organization; does not contemplate additional expense to the grower. The Fruit Growers' Agency, as organized, is the get-together instrument of the growers and selling agencies for the common purpose of

mutual protection, and through its Spokane headquarters will be handled the details so essential, though incidental, to the successful handling and marketing of the crops. The Agency, as an organization, will perform no act whatsoever of selling. It will displace no existing shipping organization. The present selling agencies will continue to act independently in their dealings with the markets. But through the mutual organization thus formed by the growers and shippers, the centering of the best thoughts and minds in the industry, will be devoted to the adoption and carrying out of advanced practices in marketing, and such matters as the extension of trade develop-

ment in the world's markets. Substantially, confidence is expected to take the place of hostility in competitive conditions, and through that confidence, economy.

Up to date, the following organizations, which represent in the aggregate a total of probably seventy-five per cent of the soft fruit and apple tonnage of the Northwest, constitute the shippers' side of the Fruit Growers' Agency, and gives a fair idea of its great scope, bringing as it does that extent of tonnage under the orderly control of the associated growers:

Apple Growers Association, Hood River, Oregon.

Idaho-Oregon Fruit Growers' Association, Payette, Idaho.

Montana Fruit Distributors, Hamilton, Montana.

Northwestern Fruit Exchange, Seattle, Washington.

North Pacific Fruit Distributors, Spokane, Washington.

Richy & Gilbert, Toppenish, Washington.

Sampson Fruit Company, North Yakima, Washington.

Spokane Fruit Growers' Company, Spokane, Washington.

Wenatchee North-Central Fruit Distributors, Wenatchee, Washington.

Wenatchee Valley Fruit Growers' Association, Wenatchee, Washington.

Wenatchee Produce Company, Wenatchee, Washington.

Western Oregon Fruit Distributors, Portland, Oregon.

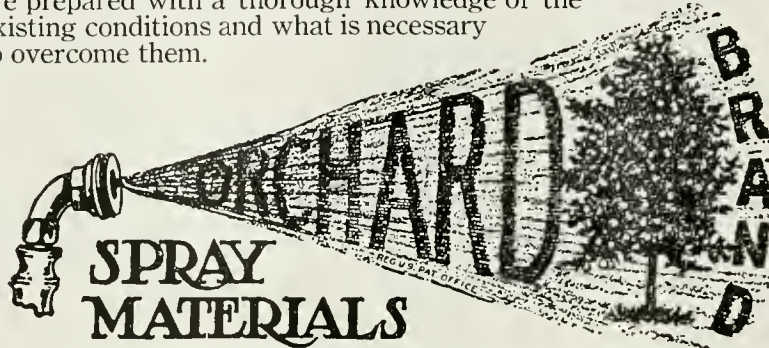
Yakima County Horticultural Union, North Yakima, Washington.

Yakima Valley Fruit Growers' Association, North Yakima, Washington.

It is made clear by the government expert that the Fruit Growers' Agency is formed for the specific purpose of providing the basis and the facilities whereby the selling agencies can carry out the provisions of the uniform contract between the growers and their individual selling agencies. In order to receive the benefits of the new plan it is not essential that the growers generally become members of the Agency. It is necessary, however, that they enter into the uniform contract with selling agents who are members of the Agency. The grower thereby becomes eligible to membership and may become an active or a passive member if he cares to do so. The board of control of the latter is equally divided between the individual growers and shippers. The respective needs of the growers in marketing conditions, and those of the shippers in production and assembling conditions, are thereby brought into common contact and discussion and the utmost facility is offered for a mutual handling of the problems arising from time to time in both the growing and marketing ends of the business. All principal districts in the Northwest are represented on the board of control of not less than eleven members, either by growers or selling-agency officials, one trustee being elected from each district, except that in the case of Wenatchee and Yakima two trustees will be active participants on the board. Other designated districts are: Southern Idaho, Spokane, Walla Walla, Hood River, Western Oregon and Montana, together with contiguous territories thereto.

Membership is divided in two classes. Active membership is open to all North-

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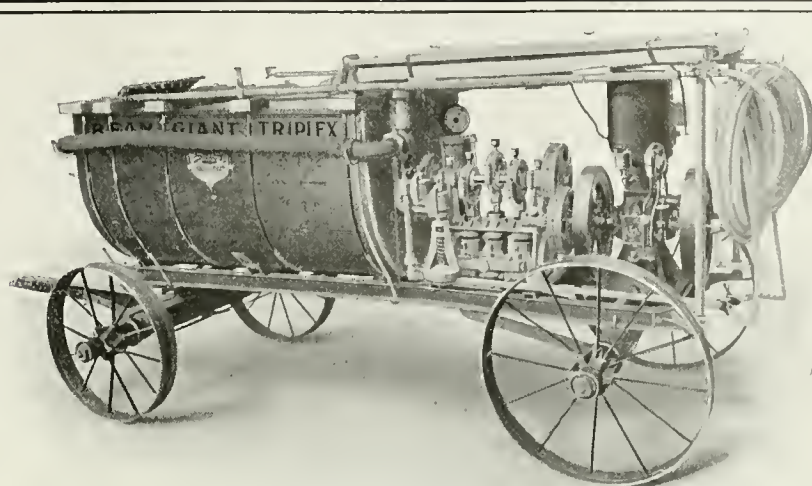
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HOOD RIVER, OREGON

western resident selling agencies having a tonnage of not less than an average of one hundred cars per season. Individual growers producing one or more carload quantities may likewise and under the same terms be active members. Under a corresponding tonnage condition, a passive membership is open to all local associations affiliated with selling agencies, as well as individual growers. Maintenance of the Fruit Growers' Agency will be borne by the shippers upon a tonnage pro-rata basis. Eligibility to membership is confined to certain specific features, namely, selling organizations must be bona fide Northwest resident bodies; they must be actual agents of the grower and market their output in his behalf; they must use the uniform contract exclusively. All other active and passive members must also be parties to and use exclusively that same contract. The uniform contract is the instrumentality about which the entire movement and organization is constructed.

The uniform contract illustrates the general scope of the entire plan. Its conditions, which are mandatory upon the selling organizations, constitute the principal great needs of the grower; incidentally they represent the very things the shippers have recognized as vital to the progress of marketing methods,—for example, the wider development of markets, the great need for a controllable and economical pio-



For Continuous, Dependable, Efficient Work

—get a Bean. It is the 42-centimeter gun in the fruit grower's fight against orchard pests—and it is pounding down the obstacles that stand in the way of bigger crops, better fruit and more profits. That's why the growers of the Northwest unite in their praise of

Bean Power Sprayers

The spraying season is on. There's no time for delay. We have a complete stock at several centrally located Northwest points and can make immediate delivery. You will make no mistake in choosing a Bean. It will do your work, do it right, and still be doing it long after cheaply built rigs would have been consigned to the scrap heap. There are scores of reasons why "The Bean is the Best" let your dealer tell you or read them in our new catalog.

Send For Our New Complete Catalog No. 30.

Bean Spray Pump Co.

213 West Julian Street

SAN JOSE, CALIFORNIA



WITTE

SURPLUS SIX

\$97.75



Sold For 6 H.P. Pulls 9 H.P.

GREATEST value I have ever offered. All sizes pull from 36 to 50 per cent over factory rating. Sturdy and dependable; Built by experts; Lowest cost of operation.

90 Days in which to try this engine. All sizes, Kerosene or Gasoline, 2 to 22 H.P. Find out for yourself that WITTE engines are not "cheap" engines, but are high quality engines **priced low**. Use one on your farm—try it out thoroughly—and let me know your decision. All sizes less than \$17.50 per H.P.

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Learn "inside" facts about the engine business. Full of interesting information.
ED. H. WITTE, WITTE ENGINE WORKS
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neering of the many foreign markets now unacquainted with Northwest fruits, as well as a steady and greatly enlarged distribution in Great Britain, Germany and other export countries. These latter have been handled under a series of almost insurmountable obstacles in the past, due to irregular and uncertain offerings and uncontrolled competition, but which can only be overcome through the employment of joint representatives directly representing the produce of the various districts. The uniform contract is thus the power wheel of the grower, his direct control over the marketing and distributing act; to the shipper it is the guide to actual practices as instructed by the grower. Jointly, the grower and marketer are thus in har-

mony in the aim to obtain the wisest and widest distribution with the greatest return at the least cost of operation.

The terms of the uniform contract are as follows:

In consideration of the mutual advantages to be derived herefrom, it is agreed between the parties to this contract as follows:

I. The grower shall have the exclusive right and authority to fix the price at which his products or any part thereof may be sold by the selling agent, but in event the price so fixed shall be higher than the best market price obtainable after offering the same, the selling agent shall in no wise be held responsible for failure to negotiate sales at such prices.

II. It shall be the duty of the agent to co-operate with all growers' resident selling agents who are members of the Fruit Growers' Agency, Incorporated, for the following purposes:

(a) To secure information as to crop conditions in order to determine the economic values of the varieties and grades.

The Modern Farmer

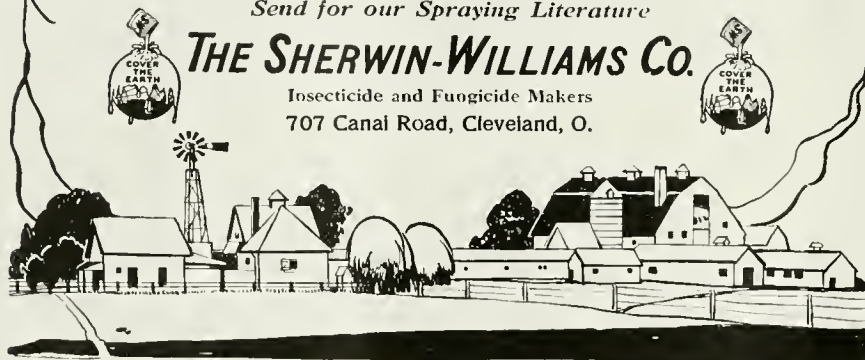
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Insecticide and Fungicide Makers
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Furthermore, did you know that these little destroyers depreciate land values an average of \$2.74 per acre? Can you afford to pay the toll? Stop it. Get rid of these pests that eat your crops, destroy your trees and vines, and spoil your land. It's easy and inexpensive to get rid of them with Kilmol.

Kilmol is a liquid chemical that both asphyxiates and poisons squirrels, gophers, etc.—Kilmol "will kill 'em all."

Waste balls are saturated with Kilmol. One is placed in each burrow, then ignited. The gas quickly penetrates to every part of the tunnel.

The waste balls you get from us are better and cheaper than home-made. Write for full information about squirrel and gopher destruction, and also ask about improved United States Government formula of poisoned barley.

It "gets" Mr. Squirrel or Mr. Gopher before he can escape. One application, costing less than one cent per burrow for Kilmol, invariably does the business—it's 100 per cent efficient. Results absolutely guaranteed or money refunded. Kilmol can also be used with U. S. Destructor—a machine invented by U. S. officials that forces Kilmol gas into burrows—Kilmol is used by Government, State and County officers.

KILMOL

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Will Kill 'Em All

Kilmol in the United States
Destructor
Gives 100% Efficiency. Invented by U. S. officials.



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Portland Seed Co.
Dept. L Portland

Washington Distributor
James & Hanes
Dept. L Spokane

(b) To work in close harmony with growers with the aim of securing uniform methods in harvesting, grading, packing and the physical handling of the fruit from tree to car; and to secure a standardization and enforcement of the grading and inspection rules of the States of Oregon, Washington, Idaho and Montana.

(c) To agree upon a date after which no contracts for tonnage shall be entered into.

(d) To discuss in conference market conditions and experiences with various mediums used in the markets for the purpose of ascertaining the most efficient agencies and market outlets for the economical performance of their mutual contract.

(e) To secure improvement in transportation and storage service and conditions.

(f) To work out definite plans for the development of various domestic and Canadian markets, utilizing experienced men and the combined resources of the said agents.

(g) To develop foreign markets along the following lines:

(1) To conduct comprehensive foreign investigations for the purpose of knowing trade demands and making reliable trade connections.

(2) To see that the fruit is prepared for market so that the grade and pack may be in accordance with the best trade demands.

(3) To supervise the physical handling of the shipments through to final destination and to secure adequate insurance so that the hazards may be reduced.

(4) To secure capable foreign agents to conduct sales abroad.

(5) To expand old markets and develop new ones by direct contact and through the solicitation of special agents.

(6) To devise ways and means to safeguard and secure prompt collections.

(7) To secure adequate transportation facilities by underwriting steamship charters and promoting new fruit trade routes.

(h) To pool proceeds of sales and share pro rata any loss sustained in the development of new markets, according to the varieties and grades, over definite periods, so that profits and losses therefrom may be equalized.

(i) To secure the standardization of agents' accounting records, to the extent that all account sales issued by the said shipping agencies will be figured on the same basis and in such manner that they will be uniform, allowing true comparisons to be made by the grower between the services rendered and prices secured by the different agencies.

(j) To secure an annual audit of the sales records of the current season's business of said agents by firms of certified public accountants of recognized standing, the reports of these audits to be available to the growers not later than one month prior to the closing of the contract period for the next season.

(k) To make all possible legal and banking arrangements for the financing of the growers.

(l) Advancements shall in no case be made in such manner as to pass title of the fruit.

The entire plan of organization and details as ratified at the meeting of February 18th, was prepared and submitted by the Office of Markets, Department of Agriculture, in co-operation with the Office of Solicitor of that Department. It contemplates the most feasible and effective plan that can be devised in the formation of an organization of growers and shippers operating together to obtain the results that all marketing agencies and growers have been trying to reach. The activities of the government in behalf of the Northwest fruit industry are the results of their previous observations as well as pressure brought by growers, marketing agencies, bankers, chambers of commerce, and other sources throughout the Northwest for direct federal aid in the solving of the growers' problems. They emphasize the great progress made by the Department of Agriculture in developing a competent and constantly growing system dealing with marketing conditions, so long the aim of the Washington officials. By those thoroughly conversant with general conditions in co-operative effort among

the producers of the nation, this is stated to be the most extensive and potential program that has been adopted in any section of the United States.

Articles of incorporation, constitution and by-laws were also ratified at the meeting, and the filing of the corporation articles arranged for. The Fruit Growers' Agency is being incorporated under the laws of the State of Washington as a non-profit, non-capital body. Further meetings are to be held at the Spokane office regularly, and in charge of an executive secretary, under the direction of the executive committee, will shortly become the prominent factors in Northwest fruit conditions. The government experts, C. E. Bassett, Clarence W. Moomaw, and W. H. Kerr of the Office of Markets, Department of Agriculture, under whose auspices the meeting was held, will visit every producing district in the Northwest in the interest of meeting and discussing all vital questions directly with the growers, and an extensive program of research work along different lines will be part of the additional investigations of the Department of Agriculture. Working committees of the Agency were appointed at the meeting, but the election of officers will not take place until the next regular meeting. The opening of the Spokane office will likewise be deferred until such time.

The I. H. C. Almanac for 1916 has just been issued by the International Harvester Company of Chicago, and can be obtained from them free upon request. The almanac is a magnificent book printed in colors, containing 18 pages, discussing in a very practical way many subjects of importance to the farmer and fruitgrower, such as feeding, silage, plans for home buildings, fuel for kerosene engines, weights and measures, information about handling stable manure, short treatises on proper tillage, statistics on dairying, prevention and cure for hog cholera, etc. In fact, the amount of information contained in this almanac makes it a sort of an abbreviated encyclopedia for the farmer.

In Walla Walla they have an organization called the Walla Walla Sprayers' Association, the purpose of the association being to spray orchards for fruitgrowers who are not prepared to do their own spraying. The scale of prices for the coming season is a charge of six cents per gallon for spraying where 500 gallons or more are necessary at a spraying. An organization of this kind in other districts would be very helpful to many fruitgrowers whose places are not sufficiently large to justify them in purchasing or owning the proper kind of an outfit. But an orchard has to be pretty small that does not justify the owner in owning a good spray outfit.

Cashmere fruitgrowers apparently have suffered from car shortage during the past year, as they have put in an urgent request for better service in the future.

Valuable Book Free

Every farmer who owns an engine or expects to buy one ought to know about engines—how to judge them, how to apply simple tests, how to figure exactly what an engine is worth. This interesting and valuable information is given in the free illustrated book, which will be sent without any obligation to any reader. Simply send name today to E. H. Witte, 188 S. Oakland Avenue, Kansas City, Mo.—Adv.

WANTED! AN ASSISTANT to Superintendent. Party should have knowledge of General Farming, Dairying and Horticulture. Special duties will be care of live stock, overseeing marketing of fruit and clerical work. Applicants should give age and state if married or single, names of former employers, length of time with each and work done while in their employ. Address W. H. Weber, Mosier, Ore.

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These are the principal pests and diseases affecting
the apple orchard

LILLY'S Soluble Sulphur

Is the best spray for scale, mildew and scab. It has a proved record of five years. Effective, Economical, Convenient.

Note results obtained by—

Washington Station, using 20 lbs. to 100 gallons:
Yakima Valley in 1913—99% scale killed.
Yakima Valley in 1914—98% scale killed.
Wenatchee Valley in 1915—98% scale killed.

Note results obtained by—

District Inspector at North Yakima in 1914 with
20 lbs. to 100 gallons, 99% scale killed.
Again three tests at different strength in 1915:
15 lbs. to 100 gallons—75% scale killed.
20 lbs. to 100 gallons—96% scale killed.
25 lbs. to 100 gallons—98% scale killed.

This is an indisputable scientific record.

100-lb. drum.....	\$7.50
10-lb. can.....	1.25
1-lb. can.....	.20

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If You Want to
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SCALE,
MILDEW
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Send for our
1916 SPRAY
BULLETIN
It tells about the
Best Spray and
how Best to
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WANTED

position as manager of orchard. Experienced in growing apples and pears and in general farming. Understand irrigation thoroughly. Will furnish references upon request. Address "Horticulturist," care "Better Fruit."

WANTED

Position as Horticulturist by practical expert with years of experience. College graduate. Can give very good recommendations. Address S. N. L., care of "Better Fruit."

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Write us. Free Literature for any fruit or crop.

NITRATE AGENCIES CO., SEATTLE, WASHINGTON
IMPORTERS AND DISTRIBUTORS

Squirrels and Gophers.—During the next few weeks these pests will become exceedingly active. Gophers frequently cause serious losses, especially in young orchards. There are many remedies, in addition to traps, in the way of poisons which can be used very successfully in exterminating both these pests. This is a subject fruitgrowers should investigate and prepare themselves with either traps or poisons which can be used in the runways and holes. Growers have lost as many as several hundred trees in a year from these pests which are worth several dollars apiece, according to the age. If they would take the pains to kill the gophers and squirrels they could save this loss.

Inoculation for Legumes.—A number of fruitgrowers throughout the West have been experimenting with the inoculation process and meeting with splendid results. Inoculation is now being extensively recommended by the Experiment Station at Pullman, Washington, for clover, alfalfa and vetch and various legumes. Frequently where the farmer has failed to get a good stand from lack of bacteria in his soil, by inoculating his seed he has been very successful in getting a good stand. Comparative tests show that where seed is inoculated the crop is much heavier.

We want the Grower to get
Nitrate at a reasonable cost
—learn of its general use—
and make more money.

Apple Estimates for 1915.—According to the monthly Crop Report issued by the Secretary of Agriculture, the apple crop for 1915 was 76,676,000 barrels, and for 1911 81,100,000 barrels, which shows that the crop of 1915 was only about 10 per cent less than the crop of 1911. But gee whiz! what a difference in prices! It must be very evident to the thinker that the low prices for 1911 were not owing to the difference in quantity or overproduction, when there was only 10 per cent difference in quantity and almost 100 per cent difference in the prices in many districts.

Apples on Cold Storage.—According to the government reports on boxed apples on cold storage, February 1st, 1915, there were 3,411,132 boxes; February 1st, 1916, 2,571,960, almost one-third less in February, 1916, as compared with February last year. Therefore it looks very much as if the balance of the box-apple crop, if active movement is continued and prices made reasonable, should be cleaned up with comparative ease.

Apple Exports. Apparently the exporting is falling off very extensively this year, as reports from many sources indicate that the quantity exported this year was probably less than one-half the tonnage exported last year.

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
Made Payable to

Better Fruit Publishing Company

E. H. SHEPARD, Editor and Publisher

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Statement of Distribution of Northwestern Box Apples.—No more important communication has ever been given the apple growers of the Northwest than is contained in the article on this subject appearing elsewhere in this edition. Your particular attention is called to the fact that the government sent representatives to gather information about the distribution of Northwestern apples for 1915. They asked the selling concerns, shippers and growers to co-operate, giving the distribution of all cars shipped; they also asked for the same information from the railroads. The railroads co-operated, showing the destination of 9,407 cars. The fruitgrowers did not, because their co-operation only reported 4,313 cars. But it must be stated that all the reliable shipping concerns of the Northwest co-operated by giving the information requested. Those who did not were independent shippers, consigners and small operators, and Eastern dealers. When the government becomes interested sufficiently to send representatives to help the apple industry of the Northwest, the government paying the expenses, it is very strange that the growers cannot see the wisdom of co-operating and furnishing the information requested. But nevertheless it is a fact they did not do so during the year 1915. As long as the growers will not co-operate among themselves or with the government there is no reason why they should blame anyone but themselves when they fail to receive proper values for their apples. The future is before us. Our success depends on ourselves. If we assist those who are trying to assist us—more particularly is meant in this case the Marketing Bureau connected with the United States government and



MYERS SPRAY PUMPS

Are you raising apples equal to the fine Myers Sprayed Fruit shown in this barrel? If not, it's high time to get busy with your fruit trees, and help them produce normal crops by protection through spraying. Get a MYERS SPRAY PUMP—They cover the entire field, and are used successfully by leading fruitmen and gardeners everywhere.

Myers Automatic Power Spray Pump
Fitted with Pressure Controller
Does not require a Relief Valve

Fig. 1727



**Two Sizes
2 and 2½
Cylinders**

Write for new catalog—just off the press, and brimful of modern Outfits and valuable spraying information. It's free—Drop us a postal today, addressing Department 8, No. 120 Orange Street.

F. E. MYERS & BRO.
ASHLAND, OHIO.
ASHLAND PUMP AND HAY TOOL WORKS

the associations and selling concerns that are handling our apple crop—there is every reason to assume that we apple growers can not only better ourselves but that in the near future we can dispose of our product for its market value, getting full market value by proper distribution and able salesmanship. But until the fruitgrowers are willing to do this, in fact until they do it, they cannot look for any increase in prices or betterment of present conditions except during occasional years when the crop is light, and therefore prices are good.

Fruit Growers' Agency Incorporated. This agency is the result of the excellent work done by the Bureau of Markets. It is to be noted that those who have handled the largest quantity of apples are the associations and selling concerns that are old and tried out, who are showing their approval by incorporating the agency and becoming affiliated as members, agreeing to act and follow the advice, instructions and requirements as laid down by the government officials.

Paragraph 1, "That every grower should have the exclusive right to fix

the prices," is the right kind of recognition of the apple grower ownership and a necessary arrangement on account of the trust laws.

Paragraph 2: (a) Good wisdom is shown by making it the duty of the selling concerns to co-operate for the purpose of securing crop conditions. (b) Good sense is also shown in the demand for closer harmony among the growers and selling concerns for the purpose of securing uniform methods in harvesting, grading and packing, which are absolutely necessary in order to standardize our present brands. (c) No better law was ever laid down than the one requiring a final date for contracts. (d) Shows an appreciation of conditions by recognizing the importance of conferences by the selling concerns on market conditions, experiences and mediums necessary in the sale and distribution of the crops. (e) Improvement in transportation, storage, etc., is another important matter that should never be lost sight of, but should always command continuous attention. (f) Calling for definite plans for the development of various domestic and foreign markets, whereby all selling concerns can pool for the development

of new outlets, is a privilege granted by the government that should be much appreciated. (g) Under the heads of one to seven, calling for a comprehensive foreign investigation; proper preparation of fruit in accordance with trade demands; supervision of the handling of shipments so they may reach their destination in good condition; conducting capable and reliable foreign sales agents; expanding old markets and developing new ones; devising ways and means and safeguarding and insuring prompt collections; securing adequate transportation facilities, are all subjects of vital importance to the fruitgrower.

If proper attention is given to these suggestions and co-operation of the selling concerns obtained there is no question but that improvements and betterments can be secured and better net results obtained, which is what all apple growers need. It is what they are asking for and demanding, therefore there is no excuse or reason why these suggestions given by the government, as outlined in this brief editorial and more completely expressed and fully explained in the article appearing elsewhere in this edition, should not be followed out carefully, conscientiously and satisfactorily in accordance with the advice given, by every selling concern, every apple grower of the entire Northwest. In addition, this movement should be supported by every bank and every business man of the Northwest whose business in any way depends on the fruit industry, either directly or indirectly.

Other particularly valuable features in connection with the plans outlined appear under the following sub-paragraphs: (h) To pool proceeds of sale and share pro rata any loss or profit that may occur in the development of new markets. (i) Referring to the standardizing of agents' accounting records is particularly important. (j) An annual audit of sales records is something every fruitgrower has been looking for and complaining because he did not get it. (k) Paragraph h, covering the financing of the apple crop, is a necessity which every apple grower realizes fully from past experience. (l) Referring to advancements is a needed reform, about protection to fruitgrowers, which they have not enjoyed in the past, as it does away with the evil of title passing where advancements are made.

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NONE BETTER

Complete line of Fruit Trees,
Small Fruits, Ornamentals, &c.
Write for catalog and prices.

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NORTH YAKIMA, WASH.

A few salesmen wanted.

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Elsewhere in this paper you will find factory advertisements of nationally known lines of orchard and farm implements—handled in the Northwest by us and our agents.

Myers Spray Pumps and Power Sprayers

A line we have handled for years. We carry the Largest Stock of Spray Pumps and Fittings on the Coast.

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We assisted in the development of this wonderful harrow. Nothing Like It for Orchard Cultivation.

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We do not handle imitations. When you want a Double or Single Action Cutaway buy the Original Clark Harrow and you make a safe investment.

**BIRDS OF A FEATHER
FLOCK TOGETHER**

Our entire line is built upon a quality basis. Get our prices on anything you need in Farm Implements and Supplies.

Mitchell
LEWIS & STAYER CO.

Portland, Ore.
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Spokane, Wn.

If You Grow Fruit

and wish to attain quick and sturdy growth for your trees; if you want to increase the quantity and improve the quality of your fruit, you should use

BEAVER BRAND ANIMAL FERTILIZER

"A Fertilizer for Every Soil"

Contains nitrogen, phosphoric acid and potash in the proper amount to replenish your soil with the plant food necessary to make steady growth of your trees certain and insure quality yields.

Place a trial order today.

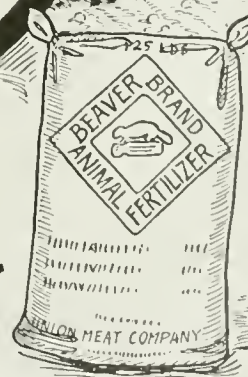
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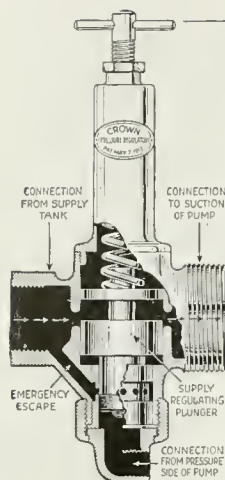
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THE CROWN PRESSURE REGULATOR (shown in cut) designed by the late J. D. Wallace, and originally called the "Wallace Pressure Regulator" was practically the "pressure regulator" designed for spraying machines. As indicated, it is placed in the suction line. Pressure acts against the bottom of the plunger which moves upward against reaction of spring, tending to throttle the suction. In practice, tests show that the plunger is constantly moving up and down, slightly closing or opening the suction in proportion to the amount of liquid used. Tests also show that this in turn affects the load on the engine. Thus power used is at all times proportioned to the liquid used. The **"CROWN"** is the simplest and most efficient regulator sold, and the only one based on this principle. See our ad in last issue on "RELIEF VALVES." Write for descriptive pamphlet.

"Crown Relief Valve," postpaid, \$4.00.

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CROWN SPECIALTY COMPANY, 1629 Washington Boulevard, Chicago, Illinois

Attention of Fruit Growers

THE 1914 apple crop brought mighty low prices. In the year 1915 apple growers were discouraged, many of them were short of money, and for these and other reasons too numerous to mention very poor work was done in the orchard. The fruit growers neglected their orchard work and devoted all their time to agitation meetings on the subject of marketing. The result was a heavy loss from scab, codling moth and various other pests and diseases, all due to neglect. The first step to making money in the orchard business is the production of a clean crop. The next step to success is obtaining a reasonable price. We have marketing concerns for that purpose. It is up to us to see that they do their work properly. But we ourselves must produce the clean crop. This cannot be done without proper equipment and proper materials, and therefore the editor desires to make a few comments on this subject, calling your attention to equipment and materials.

Spray Outfits.—You cannot do a good job of spraying unless you have a good power outfit to do it with. If you try to spray with an out-of-date outfit or worn-out outfit your results will be poor. If you depend on your neighbor or hire somebody else to do your spraying you will never get it done at just the right time. Therefore the editor advises every fruit grower who has not a first-class power outfit to purchase one.

Codling Moth.—Last year the damage from codling moth was about 30 per cent, due to a lack of spraying, poor spraying, omission of sprays, lack of thoroughness and poor material. Consequently the editor advises every grower to spray for codling moth in the most thorough manner possible, using the best materials obtainable.

Scab.—The loss from scab, sometimes called fungus, was excessive in all orchards last year, due principally to not spraying at the right time or using the right material at the right time. The editor advises every fruit grower to consult the experiment station of his state and obtain the latest information and advice on this subject. An instructive article appears in the February edition by Professor Barss of the Oregon Experiment Station, who has had a wide experience in controlling scab, which the editor believes to be a splendid program. It is not the intention in this paragraph to advise the fruit grower what to spray with or when to spray, but the editor desires mostly to call the attention of the fruit grower to the fact that there are several fungicides used for scab, among which are bordeaux, lime and sulphur, atomic sulphur and soluble

sulphur. Some fruit growers have used one of these fungicides with good success, while others have obtained splendid results with another. However, it must be borne in mind that at one time of the year some of these fungicides are dangerous, inasmuch as they are likely to cause a russetting, while others at certain times of the year are not sufficiently effective for scab. The editor believes that the best kind of a program for scab would be to use the right fungicide at the right time; that is, using the fungicide which would be the best control for scab at each particular season, with the least danger of russetting.

Small Fruits.—Every fruit grower in the country realizes the necessity of not being dependent upon a single crop. While there are many lines of diversity which the fruit grower can engage in along with orcharding, such as

dairying, hogs, truck gardening and bees, Professor Lewis very intelligently advises the fruit grower to diversify by growing more kinds of fruit instead of being dependent on the apple alone. Small fruits have always paid exceedingly well and therefore the attention of the fruit grower is called to some of the following small fruits which have been exceedingly profitable: Strawberries, blackberries, raspberries, loganberries, gooseberries and currants.

Brown Aphids.—This pest causes an immense loss every year in deformed apples, and, by the way, the loss is far greater than most fruit growers are aware. The most generally used spray for the control of aphids, and one which has given satisfactory results if applied at the right time, in the right way, is tobacco extract.

Dairying.—Since the growers have found that orchards suffer from clean cultivation, they have gone extensively into cover crops, sowing alfalfa and clover in the orchard, from

Fire Blight Destroys Thousands of Trees

FIRE BLIGHT OF THE APPLE IS SPREAD BY APHIS

APHIS CHECKS GROWTH OF TREES
APHIS CAUSES LEAVES TO CURL
APHIS DEFORMS FRUIT

DESTROY APHIS WITH
"BLACK LEAF 40"

Guaranteed 40% Nicotine

Your dealer will furnish you this effective insecticide in concentrated form—200 gallons of spray from the 2-lb. can costs \$2.50—1,000 gallons from the 10-lb. can costs \$10.75. If he will not supply you we will send it to you, express prepaid, upon receipt of price. Write for Free Bulletins to the address below.



"BLACK LEAF 40"
40% Nicotine

The KENTUCKY TOBACCO PRODUCT CO.
INCORPORATED
LOUISVILLE, KENTUCKY.

which a good crop of hay can be produced each year. This will enable the fruit grower not only to keep enough cows to supply milk and butter for his own family use, but also give some an opportunity to take care of a few more and secure some extra income without extra expense. Therefore we suggest that you consult the experiment station in reference to a selection of stock, equipment, etc., that are necessary to conduct the dairying business successfully.

* * *

Spray Hose.—Every fruit grower who has done much spraying has had the experience of finding one length of hose perhaps would last a season and even longer, while others would burst before the season was over. Therefore we advise the fruit growers to be particular in

25 Per Cent Reduction

ON ALL Apple, Pear, Peach, Prune, Plum, Cherry, Apricot, Nut, Shade and Ornamental Trees, Berry Bearing Plants, Flowering Shrubs, Vines, Hedge Plants, Roses, etc., etc.

We Need Room in Our Nurseries for Spring Planting

All Stock Clean, Healthy and Thrifty. Grown on virgin soil, two years from sage brush.

Most Complete Stock in the Northwest from which to select.

All Stock True to Name

Send today for Special Price List and Descriptive Catalog

O. & F. Nursery Co.

Box 217 K

Wapato, Wash.

Windfall Apples and Culls Cost as Much to Grow as Sound Apples

Then why lose them? It is wholly unnecessary, because they can be turned into **Big Profits** by making them into **GOOD MARKETABLE CIDER** on Mount Gilead Hydraulic Cider Presses. Any size up to 400 barrels per day. We also make Cider Pasteurizers, Evaporators, Apple Butter Cookers, Vinegar Generators, Filters, etc.

Write Today for Catalog

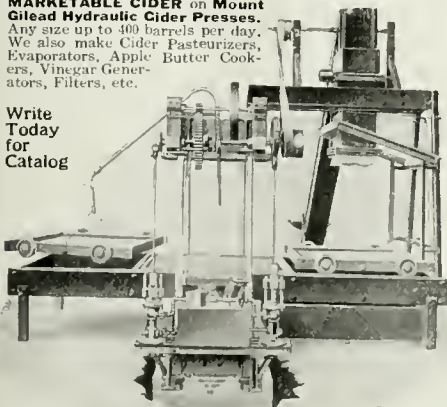


FIG. 130

THE HYDRAULIC PRESS MFG. CO.
60 Lincoln Avenue, MT. GILEAD, OHIO

Pacific Coast Representatives

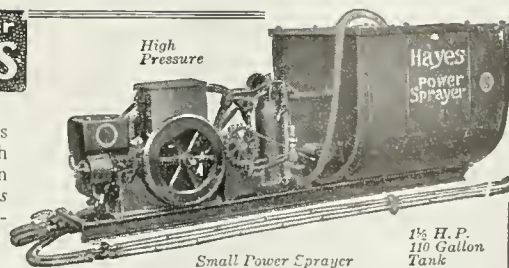
THE BERGER & CARTER CO.
17th and Mississippi Sts. San Francisco, California

Hand & Power Hayes SPRAYERS

HIGH-PRESSURE Spraying is plus spraying—it is 100% efficient. High Pressure completely atomizes the solution into a penetrating, fog-like mist that seeks out and adheres to every particle of foliage. It reaches protected pests that lurk in the innermost crevices of the bark, under bud scales and beneath the stamens of apple blossoms, and easily controls those on the outside surface. Mere "sprinkling" at low pressure will not give practical control.

Not only does High-Pressure Spraying insure a better quality of fruit but requires less solution, less time to apply, hence lessened cost. A High-Pressure Power Sprayer will pay you bigger dividends than any other orchard investment you can make.

HAYES Power Sprayers are tested to 500 lbs. and are guaranteed to develop 300 lbs. working pressure. They are built for con-



Small Power Sprayer

1½ H.P.
110 Gallon Tank

stant operation at high pressure and enduring service. This not only requires the most thorough mechanical construction but the highest grade materials, hose and fittings.

50 STYLES Large and small Hand and Power Sprayers for orchards, field crops, shade trees, hops, poultry, disinfecting, painting, farm, home and garden use. Complete outfits or separate spray pumps, hose, nozzles, fittings, bamboo rods, etc.

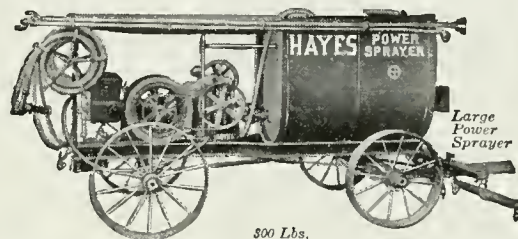
WRITE! Send postal for FREE BOOK 32 on High-Pressure Spraying and 64-page Catalog.

HAYES PUMP & PLANTER CO., GALVA, ILLINOIS



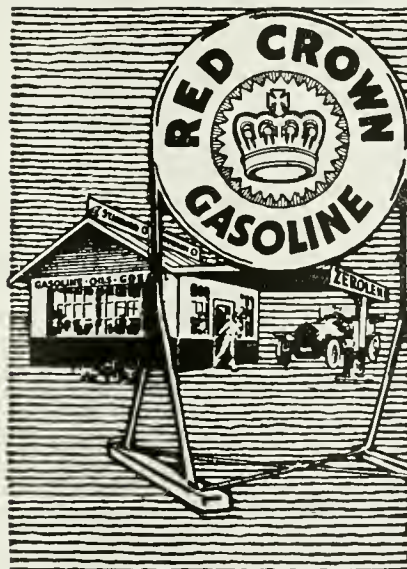
Large Hand Sprayer

50 STYLES
Hand or Power
Sprayers for
Small or Large
Orchards.



300 Lbs.
Pressure Guaranteed

Large Power Sprayer



The Guide to Pure Gasoline

Wherever you see this sign, in front of garages or at our SERVICE STATIONS, you know you can get Red Crown, the straight refinery gasoline — not a mixture.

Standard Oil Company
[California]

Use
ZEROLINE, the Standard Oil
for Motor Cars

15,000 PEAR TREES

Mostly Anjou and Bartlett
Also Other Varieties

Extra fine trees, clean and well grown. Can make you very attractive prices.
We have also a general line of nursery stock.

CHRISTOPHER NURSERIES, Christopher, Washington

their selection of spray hose. There are firms which make a specialty of manufacturing hose for spraying outfits and which will stand pressure without bursting and give a reasonable amount of wear. Be sure to get a good make of spray hose.

* * *

Labels.—Consumers are today much more exacting and particularly more so than they

were a few years ago. They are demanding their supplies in sanitary packages, in which attractiveness is a big factor. Therefore we advise every fruit grower never to ship a box of apples without an attractive label on the end of the box.

* * *

Garden Seeds.—Every fruit grower should raise a sufficient amount of garden stuff for

The Spray That Sticks



ADHESO

REG. U.S. PAT. OFF.

Insecticide—Tonic—Fungicide

WHEN other spray materials fail to do their work, because rain washed them off, "ADHESO" STICKS, killing the Codling Moth and preventing the Scab, Apple Blotch and Bitter Rot, because IT STAYS WHERE IT IS NEEDED and does not wash off on the ground.

"ADHESO" GAVE 99% CLEAN FRUIT THIS YEAR, the worst in fifteen years for Codling Moth and Scab.

Write for details and means for making the STANDARD TEST FOR ADHESION.


"Triangle" Brand Arsenate of Lead

The reason why our Arsenate of Lead costs more than others, was shown this year. Ask the growers who used it. They DID NOT LOSE 50% to 75% by WORMY APPLES. It is not the COST PER POUND but RESULTS IN CLEAN FRUIT THAT COUNT.

Ansbacher Insecticide Co., Inc.

TRIANGLE BRAND

527 Fifth Ave., NEW YORK CITY



We can quote you surprisingly low prices on

NATIONAL

Wood Stave Pipe and Tanks

Now is the time to install irrigation and water systems. Write us today for our special service covering your particular problem.

Address Dept. J
National Tank & Pipe Co.
275 Oak Street
PORTLAND, OREGON

Dust Spraying Successful

Professor Donald Reddick of Cornell University, after extensive tests, has proved that dusting successfully controls the fungous diseases and insect pests of the apple orchard. The machine used by Professor Reddick in all his experiments and tests is the

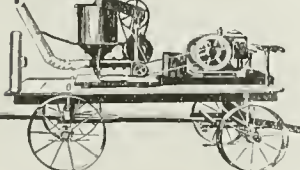
IDEAL POWER DUSTING OUTFIT

With it two men and a team can spray more trees thoroughly in one day than three men and a team can in five to ten days with liquid sprayers. A saving of time and labor of at least 60% to 75% in either small or large orchards.

Dust spraying is cheaper, quicker—easier. Anybody can do it and it takes less labor and equipment than any other known method.

FREE:—Write today for complete information regarding the tests and results obtained by Professor Reddick and the booklet "The Turn in the Road." Also descriptive catalog of dust sprayers. Learn more about this cheaper, more effective method of spraying. All the information is free and yours for the asking. Just send us a postcard today.

DUST SPRAYER MFG. CO.
1415 St. Louis Ave., Kansas City, Mo.



Also manufacturers of Dust Sprayers for every purpose—both hand and power. Write for free descriptive circular of Dusters for Hops, Vineyards, Potatoes, Cotton and Corn.

his home use, at least, and in addition to this there are many who are engaging in truck gardening to a moderate extent at least, and bringing in considerable extra money. Therefore "Better Fruit" advises fruit growers to give this matter consideration.

Harness.—From now on until spring time, on account of bad weather conditions, fruit growers will be unable to work in the orchard to any great extent. Therefore this spare time should be devoted to putting every tool and every article on the ranch in first-class condition, preparatory for spring work. Every grower should wash and clean his harness, oil it and put it in first-class condition.

Spraying.—Spraying is worse than working in the rain for getting wet, because all sprays are more or less nasty and spoil a suit of clothes very quickly. A good rubber overcoat or slicker is a great protection, both in the wet and to your clothes.

Orchard Cultivation.—You cannot do a good job of cultivating unless you have the right kind of tools to do it with. There are a number of manufacturers making orchard implements. From these you can get circulars and price lists if there is anything you need in that line.

Walnuts.—Walnuts have done exceedingly well in Willamette Valley, and from the few trees planted on the home grounds throughout Yakima and Wenatchee it is evident that they will succeed well in these two districts. Walnuts are paying the growers a splendid profit. Fruit growers should set a few walnut trees for home use at least, and there will be no trouble in disposing of the surplus, at least for some time to come, in your local towns and cities.

Tractors.—A number of the larger orchardists have found that a tractor is a big factor in the orchard business, both in efficiency and economy. To all those who have good sized orchards we suggest they look into the matter of tractors.

Gasoline Engines.—The gasoline engine has become a necessity on every farm. They are now used instead of horses and hand power for many purposes, like pumping water, sawing wood, feed cutting and spraying. There are a number of makes of gasoline engines. Be sure you purchase a good one that will save you money. With the use of gasoline on the farm, the quantity of gasoline used has increased very rapidly and very extensively. The editor knows that too many fruit growers buy their gasoline in five-gallon cans. A big saving may be made if you purchase gasoline in fifty-gallon drums.

Stump Pullers.—A few years ago clearing land was very expensive and the job was poorly done, for the reason that it was both difficult to do and costly to get the stumps out of the ground with all of their roots. There are a number of good stump pullers now on the market, which not only enable the fruit grower and farmer to clear land a great deal quicker, but to do the job much better and at much less expense.

Pruning Shears.—Pruning is one of the jobs that every fruit grower should be very particular to do well. To do this it requires a good pruning shears, one that will make clean cuts and close to the collar. Therefore we advise our fruit growers to obtain the best possible shears for this purpose. There are many good ones on the market.

From time to time "Better Fruit" will continue its suggestions about equipment and methods and endeavor to put the fruit growers in touch with the best people in these respective lines. Prices have been constantly advancing in nearly all lines during the last few months and there is every reason to assume that prices will continue to advance for some time to come, and for how long no one can tell at present. Blue vitriol has gone from 7 to 20 cents per pound; there will be an advance in arsenate of lead. Anything that you may want to use this year is likely to go up in price, as nearly all prices are



Deep Seedbeds Properly Prepared

—That's what you get when you use the deep-cutting, double-turning, leveling and compacting

"Acme" Pulverizing Harrow

"The coltlers do the work"—you should see them mix the soil, cut clods, weeds and trash and make the whole into a firm yet mellow seedbed several inches deep. The "Acme" is simple, durable and easy to pull. Sizes 3 ft. to 17 1/2 ft. wide. Thousands in use. Send for booklet now.

Duane H. Nash Inc.

345 East Morrison St. No. 23	Portland Oregon 6 1/2 ft. wide
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"Carco" KILLS MAGGOTS

A wonderfully successful spray for destroying maggots, grubs and worms which infest TURNIPS, RADISHES, BEETS, RUTABAGAS, CAULIFLOWER, CABBAGE, ONIONS, etc., and also recommended for combating crown borers in STRAWBERRIES.

This remedy has been tried out at Experiment Stations by Horticultural Inspectors and leading growers, who are highly pleased with results.

For Sale by All Leading Seed Houses on Pacific Coast. Ask for it.

Manufactured ONLY by

Standard Chemical Company

TACOMA, WASHINGTON

(Send for Circular)



Bastian Sectional Pruners

Compound Leverage. Superior to all other Pruners for Speed and Durability. Three Pruners in One. Can use 6-foot for young trees; two minutes to add 3-foot section for a 9-foot pruner; if large trees add last section; you have then a 12-foot Pruner, price \$2.25.

If not in stock by your dealer, mail us \$2.25 and we'll deliver your Pruner at your postoffice from nearest stock.

We also have all lengths of One-Piece Bastian Pruners, Shears and Pickers, Orchard Ladders, etc. Prices on application.

Northwest Fence and Supply Company

Exclusive Distributors for Bastian Pruning Tools
372-374 E. Oak St., Portland, Ore.

The Alpha Automatic Power Sprayer



FITTED WITH

The Alpha Automatic Pressure Governor

ELIMINATES unnecessary wear and tear on both the engine and the pump.

THE PUMP STOPS when nozzles are closed. No liquid being pumped except it is forced through the nozzles.

NO RELIEF VALVE or diaphragm for the spray material to corrode and get out of order.

THE AUTOMATIC PRESSURE GOVERNOR is a simple arrangement of a combined lever and spring on each plunger connecting rod, which, when the pressure reaches a predetermined limit, automatically discontinues the operation of the pump without interrupting the driving power, again permitting it to resume operation when the pressure falls below the point at which it has been set.

THIS INSURES SAFETY, secures uniform pressure and eliminates unnecessary wear (no liquid pumped except it passes through the nozzles). The pressure relief is not dependent on the operation of a sluggish or defective relief valve, but is positive and mechanical, thus making it impossible to run the pressure up to the danger point.

BUILT IN ALL SIZES from a 2x3-inch pump and a 150-gallon tank to a 2½x3-inch pump and a 200-gallon tank. (Either Duplex or Triplex.)

Send for catalog and prices.

De Laval Dairy Supply Co.

SAN FRANCISCO

SEATTLE

Everything for the Dairy

Walnuts Are Dollars

Plant a Walnut Grove

that will grow into Dollars while you sleep. The Vrooman Franquette bears at 3 years and sells for 25 cents per pound, is smaller than an apple and sells for more money. Get in with the tide and get rich. At 40 feet apart, it takes only 28 trees to the acre. Is cheaper than an apple orchard to plant, and makes your land more valuable.

True Vrooman Franquette Walnut Trees at Bargain Prices, at

MIRA-MONTE NURSERY

SAN JOSE, CALIFORNIA

steadily increasing. Therefore the fruit grower who is in need of anything, or will be in need, will do well to purchase the quantity he feels sure he will use early in the season, taking advantage of the present prices, before any further advance occurs.

Original Reflections by the Editor

The man who succeeds in the world is the one who pays attention to business.

"The early bird catches the worm." In apple growing the early spray catches the worm.

Raising fruit is a business requiring business methods, system, efficiency and economy.

"A dollar, a dollar, a ten o'clock scholar," will never succeed in apple growing.

The worm hole in your neighbor's apple looks twice as large as yours.

If you know when you know and know when you don't know, you have learned a big lesson.

Every one of the associations could get splendid prices for apples if "the other fellows" did not "cut prices."

Popularity, demand and continued demand for a brand can only be obtained by making it uniformly good and continuing to do so.

Who is the boss? You or the grader? If you are the boss, don't blame the grader if your grade is not up to requirements.

Don't be a quitter—General Grant won the Civil War because he did not know when he was licked.

If more growers hauled more loads of apples to the vinegar factory, we apple growers would make more money.

The apple grower cannot afford to stove-pipe his box any more than he can afford to wear a stove-pipe on his head.

"Did you ever see a purple cow? No, I never saw a purple cow, but I am sure I'd rather see one than be one." Did you ever see an apple grower who couldn't sell his apples better than the other fellow? No, I never saw one, but I am sure I'd rather see one than be one.

In the apple business, there is only one thing which is certain; that is, Uncertainty.

"Here comes the bogey man; if you don't look out he'll catch you." In the fruit business, there are a lot of bogey men,—codling moth, scale, scab, etc. Look out or they will catch you in 1916.

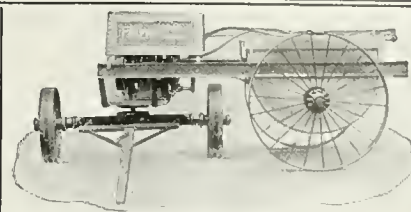
"United we stand, divided we fall." The language of the illustrious patriot, Patrick Henry, is a lesson the fruitgrowers must learn.

Don't kick. Any darned fool can do that. A mule is a kicker; don't be a mule. Kicking is destructive, not constructive.

What the fruit industry needs is constructive, not destructive, work.

A Serious Error

Farmers make a very serious mistake in failing to destroy the squirrel, gopher and prairie dog pests at the proper time. In using treated grain as a destroyer of rodent pests it should be borne in mind that the creatures are not grain eaters except and only at the time they awaken from their long winter's sleep. With the first real breath of spring they awaken, and, ravenous for food, will quickly take the poisoned grain. At this time the poison is trebly effective by reason of their famished condition. As soon, however, as the succulent grass roots appear the effectiveness of the dry food decreases, for the pests divide their attention, and later ignore the grain entirely.



"FRIEND" QUEEN

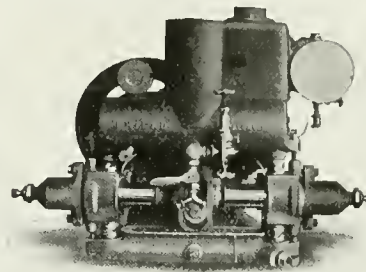
Queen of All Sprayers

Drive up and back the same row if you want to—turns short. Low center of gravity—can't overturn. High pressure Motor-Pump—easy of access. The great California and Northwest favorite.

The most practical and efficient power sprayer on earth. Hundreds in use. Backed by "FRIEND" reputation.

"Have used my QUEEN three years. If I were to buy fifty power sprayers all would be 'FRIEND' QUEEN." So says A. J. Service, of Youngstown, N. Y., where last year \$3,000 "FRIEND" Power Sprayers were sold. Sales this year already far in excess and will double.

"FRIEND" is the dealers favorite.



"FRIEND" MOTOR-PUMP.

A Money Maker

Don't waste another minute in the orchard with that heavy, cumbersome, troublesome engine and pump, when you can

Equip YOUR Sprayer

with this HIGH PRESSURE pumping unit and Spray as You Never Sprayed.

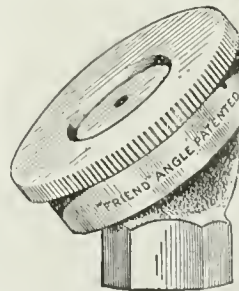
FEATURES: AUTO type motor in SOLID, COMPACT unit with HIGH PRESSURE plunger pump having QUICK detachable valve seats, QUICK accessible and adjustable packing, UNIQUE pressure regulator. Motor and Pump now have new simplified automatic oiling system, SCHEBLER carburetor, HIGH CLASS, built to a scale throughout. DIRECT connected to "FRIEND" propeller agitator in your own tank. Motor-pumps made in three sizes. Thousands in use on celebrated "FRIEND" outfits. We make exchanges. Tell what you have and want.



"FRIEND" UNIQUE PRESSURE REGULATOR

Stop That Waste

Positive action with any desired pressure. QUICK change of 50 lbs. and BY-PASS by HANDY LEVER. Works on ANY POWER SPRAYER. We make exchanges. Satisfaction guaranteed.



"ANGLE" Nozzle. Hundreds sold this year in Northwest.

Manufacturers TRUE "FRIEND" hand and power sprayers and accessories. Use "FRIEND" guaranteed SPRAY HOSE. Write today.

"Friend" Mfg. Co., Gasport, N. Y.

Money-making in Fruitgrowing

The fundamental requirement for making it is a Thorough Knowledge of the Job.

Nineteen men, each an expert on his subject have each written a booklet, and the nineteen bound together in one volume form THE MOST THOROUGH AND HANDIEST REFERENCE on the market anywhere.

Published in the interest of BETTER TREES, BETTER MARKETS, BETTER RETURNS FOR THE FRUITGROWER—not for profit.

SENT PREPAID ANYWHERE FOR \$5.00

Address: DEPARTMENT B
ALBANY NURSERIES, ALBANY, OREGON



BIG VICTORY FOR OREGON GROWN SEED POTATOES

"Pride of Multnomah" potato won first prize at the San Francisco Fair for the best acre of potatoes grown in California. Another evidence of Oregon's agricultural supremacy is a letter and a photograph just received by the Portland Seed Company of Portland from the owners of the Boa Vista Ranch at Placerville, California. The photograph shows a corner of the acre of potatoes which won first prize in the state competition for the best acre of potatoes grown in California.

Mr. E. H. Phreaner, one of the owners of the Boa Vista Ranch, writes: "We are very pleased with the results obtained from the seed ('Pride of Multnomah' and 'Snow') and will be in the market for several cars of seed potatoes. Have just received word that our exhibit of

potatoes at the Panama-Pacific International Exposition won the grand prize."

Boa Vista Ranch also won the competition for the best acre of potatoes—790 bushels of clean, healthy stock: "Pride of Multnomah." The "Pride of Multnomah" is one of the standard varieties of potatoes grown in Oregon. It has been grown in Oregon for seven years, and many experts regard it as in every way the best potato for Western Oregon. It has been shipped to all parts of the United States for seed purposes, and only excellent reports have been received. Its signal honors won in California now give it official recognition as the very head of the list. This potato is well known among most Oregon growers, and is popular because of its heavy yielding qualities,

It is Time to Quit Playing Politics and Get to Selling Apples

The epidemic of co-operative marketing and annual sales agencies and distributors seems to be dying out because of the "inherent defects" of their systems.

If you are considering independent marketing or want to know any more about how you can do your own business direct with Eastern commission merchants and brokers—provided you have sufficient business education and intelligence to use correctly the same facilities that have been successfully used by other shippers in your section—if you are possessed of these qualifications and of an ambition to get the best results from your own and your neighbor's crop, write us for full particulars and we will give you a long list of associations and independent operators who will tell you that the big Blue Book and the plans of the service, of which it is only a part, is the most effective, up-to-date assistant that you can get.

Our organization has expended sixteen long years of strenuous labor and around one million dollars in building up an equipment, the benefits of which you can get for a very trifling fee, which will permit you to do your business your own way—consign, sell on track, f.o.b. or customary terms of draft on B L—do it any way you want to, yet do it safely by avoiding undesirable traders of all classes who are trying to secure contracts for your tonnage. Let them wait until fall. They will be glad to contract with you then. On the other hand, you may be able, by that time, to do your own business.

Send for our handsome 14-page Photo-Calendar, which contains extracts from Trading rules, grades and law of commerce that appear in the big Blue Book. It is valuable from an educational and reference view-point and will cost you nothing. When you send for it, please tell us how you are situated, that we may be able to tell you exactly what special features of our different forms of service will particularly apply to your requirements.

Produce Reporter Company

212 W. Washington Street
Chicago, Illinois

its uniformity and its fine grain. It is an ideal baking and boiling potato. It is also famous for its keeping qualities.

The Portland Seed Company, who are the producers of this splendid variety, are certainly to be congratulated. The State of Oregon won practically all the agricultural honors at the Panama-Pacific Exposition. This is just another demonstration of Northwestern superiority, which we at home are the last to realize.

The Board of Directors of the Milton Fruit Growers' Co-Operative Union executed a contract for handling their 1916 crop through the Northwestern Fruit Exchange. This is one of the old associations of the Northwest that has marketed in various ways before, selling direct, selling to individual buyers and also through the Distributors. The association puts up a pack of prunes which have won a splendid reputation for their quality.

SELLING MADE EASY

The Labels Have Attracted His Attention



RESULT---MAIL ORDER

Label Users Increase Sales
And Cut Down Expenses

SEND FOR SAMPLES

We Have Labels
For Everything

United Litho & Printing Cos.

Vredenburg Bldg.

ROCHESTER, N. Y.

Dow Arsenate of Lead Paste

is the most economical and satisfactory brand of Arsenate of Lead offered on the market. Its high chemical analysis, combined with exceptionally fine physical properties, makes it by far the most widely used Lead in the United States. Our phenomenal sales of Dow Arsenate of Lead are a result of the highest quality combined with the right price. Let us quote you and send you literature or samples of the material if desired. This season more than any other in the past you should place your orders early because of the possible freight congestion and the fact that Lead Arsenate is scarce, consequently higher prices will prevail. We are in better position than ever to make prompt shipment and quick deliveries. Let us serve you.

The Dow Chemical Company, Midland, Michigan, U.S.A.

Nitrogen and Apples—Nitrogen A Stimulant

By Professor R. W. Allen, Experiment Station, Corvallis, Oregon

A SERIES of experiments were started in February, 1914, in the Hood River Valley to determine the comparative value of different elements of soil fertility upon the vigor of growth and productivity of fruit trees that had been kept continuously under clean culture since the time of planting. As the land was practically devoid of nitrogen and organic matter, the medium in which most of the soil nitrogen is to be found, a considerable portion of the work was devoted to tests of the value of nitrogen. This element was applied in various ways. A type of soil known as Hood Silt, which predominates upon the east side of the valley, was chosen for the work. The orchards had been continuously

clean cultivated since planting. The trees were of the Spitzenberg variety about 16 years of age. The plats included twenty trees each and were selected under the most nearly uniform conditions possible. The experiment in one orchard was a duplicate of the work conducted in the other except that a small amount of caustic soda was mixed in the nitrate solution applied to one and an equal quantity of caustic potash to the other.

The first season, 1914, the applications were not all made at the same time. As a result it was observed that the earliest applications, which were made March 17, exerted a marked influence upon the vigor of the trees throughout the season, while the later

applications, some of which were made May 7 and 19, did not appear to affect the trees until near the close of the growing season. The work was re-

TABLE 1—Showing the set of fruit and yield of fruit, its size, the length and width of terminal growth, and size of leaves on check plat and plats fertilized with nitrate of soda.

Treatment of Plots	Plat 1 Check Plat, Clean Culture for 18 Years	Plat 2 Nitrate Soda Solution Sprayed Onto Trees, Excess Fell to Ground	Plat 3 Nitrate Soda Solution Put on Ground	Plat 4 Nitrate Soda Crystals Spread on Ground
Nitrate applied 1914, gallons.....	None	6 3/4	6 3/4	6 3/4
Nitrate applied 1915, gallons.....	None	6 3/4	6 3/4	6 3/4
Amount nitrogen applied each year, lbs.....	None	1.08	1.08	1.08
Total nitrogen applied per tree, lbs.....	None	2.16	2.16	2.16
Total nitrogen applied per acre, lbs.....	None	70.	70.	70.
Number of blossom twigs counted.....	483	890	512	794
Per cent fruit set on counted twigs—				
June 4.....	35.3	69.6	68.0	82.6
September 30.....	16.4	37.3	30.7	31.6
* Average yield of note trees, loose boxes.....	3.75	19.	21.5	17.
Average yield per tree, loose boxes.....	.9	10.09	9.97	10.01
Size of fruit—				
175-150 per box, per cent.....	76.21	21.61	22.64	8.28
138-112 per box, per cent.....	18.32	11.87	29.13	21.71
100 per box and larger, per cent.....	5.43	23.52	18.23	68.10
Average length of terminal growth—				
1913, inches.....	6.7	5.	1.25	6.15
1914, inches.....	5.3	7.8	4.50	5.80
1915, inches.....	8.0	11.8	16.20	11.00
† Diameter of terminal growth.....	.172	....	....	.221
Size of leaves—				
Length, inches.....	2.25	2.8	2.2	2.75
Width, inches.....	1.35	1.65	1.5	1.60

* Trees with heavy set of blossoms were selected for this determination to render conditions as nearly uniform as possible.

† Measured two inches above the base.

‡ Pounds.

TABLE 2—Showing comparative length of terminal growth and size of foliage of trees sprayed with nitrate solution over canvas and of tree liberally sprayed with the same solution on ground and tree.

Treatment of Tree	Length Terminal Growth, Inches	Diam. Termi- nal Growth, Inches	Size of Foliage, 1915 Length Width
Check trees, no fertilizer—average of two trees.....	.....	6.7 5.35	8.55 .18 2.25 1.35
Nitrate of soda, one pound to one gal- lon, sprayed on tree and excess kept off ground—two trees.....	11.	8.75 6.0 3.85	3.75 .13 2.32 1.46
Very weak tree liberally sprayed with nitrate solution on tree and soil....	11.6	10.3 1.8 2.2	15. .20 2.10 1.5
Average of nitrate plats (2, 3, 4).....	5.13 6.01	11. .221 2.58 1.58

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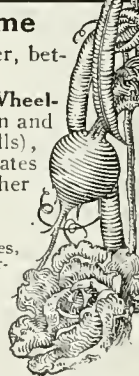
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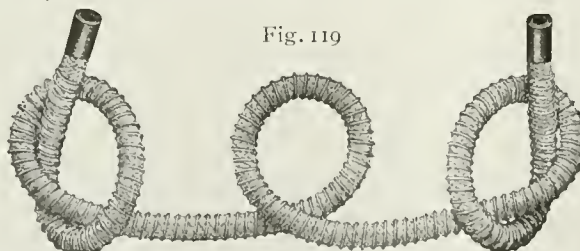


Fig. 119

peated in 1915, all applications being made at the same time, March 13 and 19 respectively, upon the two orchards. An additional plat was added to the experiment this season, designed to strengthen the work in determining if there is a perceptible invigorating influence upon the tree resulting from applying nitrate of soda to the branches and preventing its reaching the roots upon falling to the ground.

From the long-continued practice of clean culture in the orchards in the valley has resulted a seriously depleted supply of organic matter and nitrogen in the soil. With the loss of organic matter and increase in size and demand of the trees, drouth as well as shortage of nitrogen has contributed to the serious weakening of many fruit trees. This process had advanced to such an extent in some of the older and more persistently cultivated orchards that the trees had for some time been very yellow in appearance, weak and unproductive. A heavy crop of blossoms, that were weak in character and much under normal size, usually appeared each spring, but only a small number were able to develop and produce fruit. Although the trees were known to be badly in need of nitrogen as a constituent of the soil, it was decided, upon taking up fertilizer work, to find if the methods of spraying trees with nitrogen reported by Ballard and Volek as having increased production were of practical and economic value for the conditions existing in the Hood River Valley. For this purpose it was necessary to determine if the presence of nitrate of soda upon the branches exerted a beneficial influence, or if the result came entirely from the excess of the spray which fell to the ground, conveying its nitrogen to the roots of the trees. It was for this purpose that nitrate of soda was applied to the trees and ground in the manner described above.

As space will not permit all the important data being given for both experiments, from which very similar results were derived, only the one giving the most striking results will be discussed. The plats were treated as follows: (1) Check plat, no fertilizer. (2) Nitrate of soda, 1 pound per gallon of water, applied to the tree in form of spray, the excess being allowed to fall to the ground. (3) Same solution as applied to the trees in No. 2 applied to the ground about the trees. (4) Nitrate of soda crystals applied to the ground about the trees and worked in with the spring cultivation.

The nitrate solution applied to plats two and three was made up by dissolving 135 pounds nitrate of soda in as many gallons of water. To this solution was added 19 pounds of caustic soda. This quantity of spray was applied to each plat, giving 6¾ gallons of the liquid and as many pounds of nitrate of soda to each tree. To plat four was applied 135 pounds nitrate of soda, an equal quantity per tree. This application gave to each of the trees 1.08 pounds of nitrogen, which is

equivalent to 70 to 75 pounds per acre. Results derived from the first year of this work show plainly that all plats receiving nitrogen, whether it were applied to the tree in the form of a spray, or to the ground in liquid or crystalline form, were much benefited by it. No appreciable difference could be noted in the vigor of the trees and yield of fruit that could be attributed to the manner in which the nitrogen was applied. All the fertilized trees were green and vigorous, yielded heavily and presented a much more robust appearance than the untreated check plat, which was in as good condition as the others before the experiment was begun.

As the treatment of trees described above is not such as will prove conclusively that the nitrogen lodging upon the aerial part of the trees is of no appreciable value as a fertilizer, or invigorating agent, a fifth plat was added in 1915. The purpose of this part of the experiment was to find if the small amount of nitrogen that could be kept

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on the surface of the tree did in any
way affect its growth. In order to
make this determination a large, heavy
canvas was placed upon the ground to
prevent all the liquid which fell during
the operation of spraying from getting
to the roots. Owing to there being
insufficient number of trees in the
orchard which have not been in-
fluenced by the past year's work for a
full plat a smaller number had to be
taken for this determination. Five
trees were sprayed in this manner, and
as there was a quantity of the solution,
which was the same as applied to plats
two and three remaining, a tree that
appeared to be the weakest and most
devitalized in the vicinity was thor-
oughly sprayed, and the ground about
it saturated. Approximately ten gal-
lons of the spray were applied to the
tree in this manner.

The results derived from this experi-
ment in 1915, its second year, are much
more marked than those obtained in
1914. A careful determination of the
number of twigs producing blossoms
that retained at least one fruit at thin-
ning time and at picking time (See
Table 1) shows a very marked in-
fluence to have resulted from the use
of nitrogen. The manner in which the
nitrogen was applied appears to have
no relation to the amount of fruit
retained by blossom-bearing twigs.
Approximately half as many twigs re-
tained fruit at full maturity as carried
it until the first of June, although at
the earlier date many twigs upon the
fertilized plats carried more than one
fruit, while only a small number car-
ried more than one through the entire
season. The percentage of loss of fruit
from twigs on all plats between June

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and September, inclusive, was very similar. The trees upon which these determinations were made were not thinned.

The average yield of fruit per tree for plats 2, 3 and 4, which received equal quantities of nitrogen during the two years, was approximately the same, being 10.09, 9.97 and 10.01 boxes respectively. The check plat yielded .9 of a box per tree. In size of fruit there is not so close a relation between the nitrate plats. The largest apples were produced by the plat receiving the crystals, next in size by the plat having the nitrate solution applied to the ground and the smallest apples of the fertilized plats came from the sprayed trees. From the table (No. 1) it will be seen that a large portion of the apples, an average of 50 per cent are larger than are desirable for marketing, while 76 per cent of the apples from the check plat are equally as undesirable on account of being too small. The fruit from the check plat was more uniformly colored than from either of those receiving fertilizer, although the highly-colored apples from the latter were much brighter and more easily polished than the ones produced upon the check plat. Two hundred apples are being kept from the nitrate plats and check plat to determine their relative keeping qualities in cool storage.

The terminal growth of branches upon the nitrate plats have more than doubled. It is also shown that an increase has taken place in the terminal growth of trees in the check plat during 1915. This is doubtless due to the influence of irrigation which was applied to this orchard for the first time, the result being more readily apparent upon this than on the more vigorous-growing plats, Table 1. The size of the foliage on the fertilized plats is greater than that on the check, although the difference in size is by no means as pronounced as is the difference in color. Throughout the entire season all the trees receiving nitrogen were very dark green and vigorous in

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appearance, while the others were yellowish and sickly.

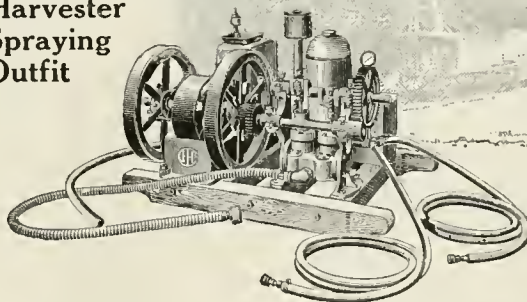
So great was the difference in the color in this orchard that the fertilized plats could be seen from a great distance. There was also a very marked difference in the attitude of the trees. The foliage and crop of the check-plat trees was so light that the branches stood up as in winter and were no barrier to people and teams passing beneath, while the branches of the fertilized trees were so weighted down with foliage and fruit that it was difficult to get through, and a team could only be taken between the trees in a very few places. Clean cultivation was continued in this orchard in 1914, but clover and alfalfa was planted in 1915 and irrigation water applied for the first time. The factor of irrigation has had but little apparent influence upon the comparative results, as it was applied uniformly to all the plats except No. 5, which, by virtue of its shorter duration, does not enter into this comparison.

Plat five was fertilized at the same time as the others, March 13. Although the weather was cloudy and threatening there was not sufficient precipitation to cause the nitrate to be washed from the branches to the ground for a number of days after it was applied. The land about these trees was cultivated in the spring, after which it was left unstirred. It was irrigated once very lightly, one furrow to the row, and the water allowed to run but a short time. The vitality of these trees had been so far reduced by drouth and starvation that blossoms were not produced in sufficient quantity to permit a determination of the set of fruit being made. The comparative effects of the nitrate spray applied to the tree alone and to the tree and ground about it are very pronounced. Table 2 shows the comparative vigor of the check-plat trees, those having the aerial parts treated with nitrate solution, the one to the top and soil of which the nitrate was applied, and those fertilized for two years with nitrate of soda, as indicated by the length and thickness of terminal growth and length and width of foliage.

From this it can be seen that the growth of the sprayed trees is much shorter than that of the check trees which received no fertilizer, but more water. It is much less than that of the tree heavily fertilized once, which is similar in growth to those receiving a smaller amount of nitrogen each year for a two-year period, and more water this year than the other. There is not

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so striking a difference in the size of the foliage, however,—that on the fertilized trees is largest. The color and general appearance of foliage on these respective areas is quite pronounced. The tree fertilized but one year presents as vigorous an appearance as those that have been treated longer, and those that received the nitrate on the branches alone are not perceptibly more vigorous than the check trees that have received no treatment—in fact they are less thrifty.

All the trees to which nitrate of soda was applied in 1914, at the rate of 6½ pounds, appeared to have been returned to full normal vigor. The second application, as is indicated by a heavy wood growth in addition to the production of a heavy crop of fruit in 1915, shows that one pound of nitrogen each year is too large an application for each tree. Fully one pound of nitrogen should be applied the first year, but the subsequent applications should be not over half as heavy. By this carefully conducted and thorough test to find if nitrogen applied in liquid form to the tops of fruit trees has a stimulating effect upon the tree, not one indication has so far been found that it has. On the other hand, it is plainly shown that regardless of the manner in which the element is applied to the soil, whether in liquid or crystalline form, it gives very strong and prompt invigorating influence to the plant. This determination, although startling in its effect upon the yield and vigor of fruit trees, appears to be of no great scientific importance. However, it is of very great economic significance owing to the important practical problems upon which it throws a strong light. The three most important results of the work are: (1) It shows plainly the extent to which the nitrogen store of the soil has been depleted by the long-continued system of culture that has been practiced, and the great rapidity with which the trees can be restored to normal vigor by application of this element. (2) As no beneficial influence of sufficient importance to be observed has resulted to the physical character of the soil from the application of nitrogen in the form of nitrate of soda, the use of nitrogen in this form should be very limited. It finds its greatest value for the purpose of stimulating very weak trees until such time as leguminous crops can be grown and turned into the soil. (3) When nitrate of soda, as a source of nitrogen for devitalized and unfruitful fruit trees, is to be applied it can be done more cheaply and with equal results by distributing the crystals upon the ground in early spring and working them in instead of going to the expense of preparing a solution and applying it in the form of a spray.

The cost of nitrogen in nitrate of soda applied at the above rate is approximately \$16.00 per acre. An average crop of vetch, which can be grown for \$10.00 or less, accumulates about 74 pounds of nitrogen, approximately as much as was applied to these trees.

In addition to the benefit derived from incorporating the vegetable matter into the soil the nitrogen can be acquired more cheaply by growing legumes than by purchasing commercial nitrogen. By the proper use of live stock a large portion (possibly 80 per cent) of the fertilizer value of forage consumed should be returned to the land and a moderate profit derived from feeding it. Nitrogen in its various commercial forms should not be generally used. It is desirable for extreme cases only, as similar and far more permanent results can be gotten by the use of leguminous crops. Not only does the application of nitrogen-bearing organic matter supply the much-needed nitrogen to the trees, but it exerts a very beneficial and lasting effect upon the tilth and water-holding capacity of the soil. A very striking example of the influence of clover upon the condition of the soil and the growth of trees upon it exists in a Hood River orchard in which a portion of the land was devoted to clover previous to planting of the trees. Although the trees are about 18 years of age, the soil is in better physical condition and the trees are considerably larger than in the remainder of the orchard.

The system of cropping that should be used depends largely upon the available supply of moisture. Where irrigation is not provided for the use of winter cover crops of common vetch (*V. saliva*) or hairy vetch (*V. villosa*) should be used. This practice, followed by systematic clean cultivation throughout the summer, will maintain the fertility of the land and result in the greatest possible economy of the limited supply of moisture, all of which will be needed by mature fruiting trees. Upon irrigated land more or less permanent crops can be grown in the orchards, as has been partially demonstrated in all parts of the district. The crop that is of greatest value for use in the orchard has not yet been fully determined.

Red clover has many advantages over alfalfa for use with fruit trees in the orchard. Clover is preferable to alfalfa in a minor way on account of its greater tolerance of shade and cool weather and consequent longer period of growth. The principal feature in which clover is superior to alfalfa is the influence it has upon cultivation of the soil by its habit of dying out at the end of the second or third year.

Frequent thorough stirring of the soil is very necessary for many reasons, the principal of which are to permit its being properly aerated, which process is vital to the life and activity of myriads of bacteria whose function in the soil is to bring about the decay of organic matter with its consequent action upon the many elements of plant food within the soil. Where alfalfa is used the tendency is to not cultivate the soil sufficiently. Once this crop is well established the land can be thoroughly worked at frequent intervals with no appreciable injury to the plants, but it is seldom done.

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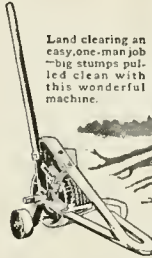
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One of the greatest benefits to be derived from the growth of leguminous crops in orchards are those resulting from the influence of the vegetable matter upon the physical condition of the soil and from the result of decay of this material rendering its chemical constituents available as food materials for the trees whose welfare they are designed to influence. The sooner crops are plowed into the soil and allowed to decay, the sooner will their beneficial influence be felt. The refrigerant effect of the shade of such crops and the application of irrigation water appear to have a beneficial influence upon the trees. This and the possible influence of legumes being associated with non-legumes frequently exerts a marked influence upon the appearance and vigor of trees before an appreciable amount of plant material has decayed upon or within the soil.

A splendid example of what can be accomplished by the proper use of cover crops is the orchard owned by F. R. Radford, which is upon a soil very similar to the above experiment. When his orchard began to show signs of distress, some seven or eight years ago, he began immediately to use winter cover crops, and continued systematic clean culture during the summer season. During the past three years he has applied irrigation and is growing clover and alfalfa. He has also gone over the entire tract with a light application of stable manure. As a result of this careful treatment three successive crops of fruit have been received, and the trees are quite vigorous and thrifty in appearance. Indications are that in this orchard, while bearing full crops of fruit, the trees are being forced into too strong wood growth. From this it appears that too great an amount of nitrogen is being supplied to them. Thus it appears that the use of leguminous cover crops can be overdone as well as can the use of commercial nitrogen.

Upon the appearance of such a condition the crops should be dispensed with for a time and systematic clean culture again brought into practice. These results suggest the feasibility of adopting, within the orchard, a systematic system of crop rotation planned to maintain the fertility of the soil by growing certain crops on different portions of it in regular succession. Such a practice would be a most valuable method of operating an orchard, for by its use sufficient forage could be grown for the stock necessary upon the farm and the labor would be equally distributed throughout the year, and from year to year. It would also foster economical and constant use of irrigation water, and, in the end, would bring about a most accurately-balanced series of farm activities, which condition is conducive to the greatest possible economy in operation, a factor which I consider to be next in importance to the maintenance of a desirable state of fertility within the soil.

Tomato Blight a Serious Menace to Tomato Industry

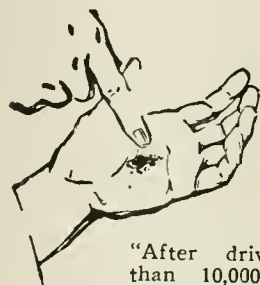
By F. D. Heald, Professor of Plant Pathology, Washington State College, and Plant Pathologist of the Washington Agricultural Experiment Station

DURING the past 20 years tomato blight, known also as the "yellows," "yellow blight" or "western blight," has been a serious menace to the tomato-growing industry in many parts of the Pacific Coast country. Up to the present time the trouble has been supposed to be peculiar to the Pacific Northwest. Various investigators have given more or less attention to the study of the disease since 1896, but the first publication claiming the establishment of the cause of the trouble appeared in 1914. In the bulletin referred to H. B. Humphrey, in "Studies on the Relation of Certain Species of Fusarium to the Tomato Blight of the Pacific Northwest," claims that tomato blight is caused by one or more species

of Fusarium which parasitize the root system. His results were based upon observations covering a number of years, but notwithstanding this fact there seemed to be some ground for questioning the reliability of his conclusions.

A strong element of doubt was introduced for two reasons: (1) The tomato blight is lessened in severity by certain factors which ordinarily are favorable to Fusarium diseases, notably, increased use of fertilizer. (2) The symptoms of the disease, as recorded by Humphrey and others, are different from what one would expect if the causal organism were a Fusarium. On account of this doubt as to the true cause of the disease the investigations carried out during the past season were directed in the main to discovering this one fundamental fact, the cause of the disease. It should be constantly borne in mind that the important point in all control work is clear and definite information concerning the cause of a

description of the symptomatology characteristic of the disease. The great variation in the symptoms accompanying the attack should lead us to discard the old names, such as blight, yellows and yellow blight, while western blight is equally objectionable, since the disease is not peculiar to this region. The least confusion will prevail if we designate the disease by the



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Tomato Roots showing Sclerotia of Rhizoctonia trouble. It seems that much of the aimless wandering in control work of the past twenty years as far as tomato blight is concerned might have been avoided if we could have had a definite understanding of the cause of the trouble.

The investigations carried out at the Experiment Station during the past season, as well as the field observations made at various places in the state and adjacent territory, have all pointed to the fact that tomato blight is caused by the sterile fungus, Rhizoctonia, and that the species of Fusarium reported by Humphrey are entirely secondary in their relation to the disease. It seems strange that with all the work of able investigators during the past twenty years, the cause of tomato blight should have remained a mystery up to the present time. This is no reflection upon the ability of the workers connected with this problem, but rather points to the difficulties that the scientist encounters when delving into the realm of the unknown.

In the light of the investigations conducted during the past season it will be necessary to revise somewhat the



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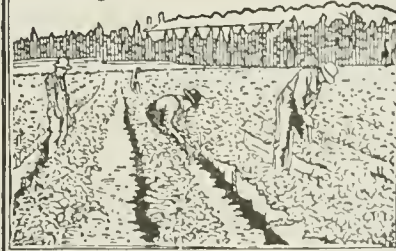
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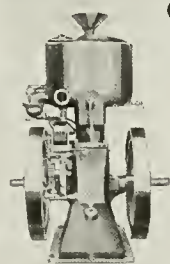
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name of the causal organism and speak of the trouble as the "Rhizoctonia disease."

Confining our attention first to the disease as it appears upon plants that are mature or approaching maturity, the deviations of the affected plant from the normal may be noted. The following most prominent effects upon the aerial parts of the plant may be observed: (1) Dwarfing or reduction in size of the entire top. (2) The production of the rosette type of growth. (3) Discoloration of the foliage. (4) Curling or rolling of the leaflets. (5) Reduction in size of fruit and premature ripening or failure to set any fruits. (6) Wilting and death of entire top.

The parasite is not present in or on the aerial parts of the plant, the deviation from the normal being due to the indirect effect of the parasite upon the root system or basal portion of the stem at or below the ground level. On these portions of the plant the following changes may be noted: (1) A network of brown fungous filaments upon the surface of the roots. (2) The occurrence of black nodules or masses (sclerotia) at various points upon the roots. (3) The presence of dead corroded areas (lesions) upon roots or basal portion of the stem. (4) The death of roots from the tip backward. (5) An abnormal production of adventitious fibrous roots.

The reduction in size of the entire top may be very pronounced or scarcely noticeable, depending in part upon the time of the attack and in part upon the rapidity of progress of the disease. In case the attack becomes severe in the early part of the development of the plant, the drooping effect will be the most pronounced. In late infections or light attacks of the disease the affected plant may reach nearly normal size.

Affected plants may show the rosette type of growth, or this effect may be almost entirely absent. In the extreme development of the rosette habit the plant may remain under-sized and produce an abnormal number of closely-clustered branches with the complete elimination of fruit production. This behavior led to the use of the term "tomato rosette" for this disease in Ohio and other sections of the Eastern United States. Seriously affected plants that first exhibit the disease late in their development are likely to show more than an ordinary production of branches from the lower-leaf axils, in case the fatal culmination of the disease is delayed.

Color changes of the foliage are among the noticeable of the symptoms. The affected plant may show a general pallor with more or less yellowing of the leaves over the entire plant or the color change may be more localized. The foliage of one branch may show a yellowing while that of the remainder of the plant is normal. In many cases it is the lower leaves of the plant that show the first yellowing, although this is not an invariable rule. The

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chlorotic foliage soon begins to show more or less brown dead tissue and in many cases the dead areas appear first between the main veins or at the margins of the leaves, that is, at points farthest removed from the water-conducting channels. In many cases the affected plants show more or less purpling of the leaf veins upon the under surface, although this is not a constant characteristic and may even be exhibited to some extent by healthy plants. The glaucous or grayish sheen of affected foliage is not constant, although in some cases it is quite noticeable.

The curling or rolling of the leaflets is very characteristic, although not a diagnostic character. There is a pronounced tendency for the edges of the leaflets to roll upward and inward toward the midrib. Again, this character may be very pronounced or only moderately developed. In some cases the leaflets appear to be more rigid than those of healthy plants.

A seriously affected plant may succumb before it has reached a sufficient size to set any fruit, but in the majority of cases the culmination of the disease is not reached until the host has fruit that is a third or more grown. The attack of the disease hastens the maturing processes and retards the growth of the fruit in size, many of which ripen prematurely. A mature plant that has succumbed as a result of the disease will show brown dead foliage and many under-sized fruits that possess a depth of color indicative of ripeness.

In a certain per cent of the attacks the affected plant which has exhibited some of the various symptoms mentioned, will succumb before the end of



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the growing season, while in other cases the plant will survive, but will make only a poor development. The writer has seen some fields in which all individuals of a certain variety were showing symptoms of the disease to a greater or less extent.

The roots of a normal tomato plant when removed from the soil and freed

from dirt are smooth and of a pale-straw color. Affected roots show varying degrees of darkening and an examination with a hand lens will show in many cases that they are covered with an interlacing network of minute brown threads or filaments, the mycelium or vegetative body of the fungus. In the younger stages or under cer-

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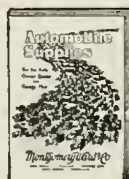
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tain growth conditions these filaments remain colorless, and so are not evident even with the hand lens. In some cases the network of fungous filaments may be so abundant as to be distinctly noticeable to the naked eye. The demonstration of the presence of the fungus upon the roots is one of the most certain methods of diagnosing the disease.

Black nodules or masses of fungous tissue, which have the appearance of dirt that will not wash off, may frequently be found on the larger roots. They may vary in size from mere specks to masses a quarter of an inch in diameter. These are the so-called sclerotia, or resting bodies of the fungus. They are produced very rarely upon the roots of some varieties, while certain varieties, like the Dwarf Champion, for example, produce them in abundance.

Dead corroded areas of varying size may be found upon the roots or upon the basal portion of the stem at or below the ground level. The death of the roots from the tip backward is, however, more common on the tomato than scattered or separated lesions. The young absorbing roots appear to be killed first and then the larger lateral-conducting roots. In an advanced stage of the disease, the cortex or outer portion of the larger roots may be more or less disintegrated and separate easily from the firmer central axis. The killing of the absorbing roots is the most serious phase of the disease.

An abnormal production of fibrous roots from the base of the stem is a frequent accompaniment of the disease. This condition prevails if the plants are set fairly deep and receive a sufficient supply of moisture. This increased production of roots frequently prolongs the life of the plant, since the work of absorption generally performed by the more widely distributed roots is provided for, until the new roots in turn are killed.

Rhizoctonia does not confine its attacks to maturing plants, but affects tomato seedlings, producing the trouble known as damping-off. In this case the fungus attacks the young stem at or near the ground level and the sudden drooping of the young plant is the result. The little seedling "drops dead" as it were. Damping-off of tomato seedlings by Rhizoctonia has been reported from various parts of the United States, both east and west and in the extreme south.

Another phase of the disease is worthy of mention, although it is of minor importance. The fungus may invade the ripening fruits and cause a characteristic rot. This condition is only found when the fruits rest upon the damp ground in which the fungus is growing. The fruit rot has not been observed in our work during the past season, but the writer studied it a number of years ago in Nebraska, and other investigators have reported the same condition in Florida and Cuba.

Continued in next issue

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Destructive Plant Lice, or Aphids

Continued from page 16

of the poisoning. It is often malformed and usually hangs on the branches longer than normally.

The stem mothers of the Rosy Aphis hatch very early in the spring and soon push their way into the swelling buds. Sometimes a dozen and more of the minute green lice, blueish with a coating of whitish powder, can be found within a single bud. The second-generation females quickly curl the leaves, making their control by spraying them practically impossible. The pupae of the winged generation are yellowish pink in color, but the adult migrants have a black thorax like that of the Green Aphis. The entire life cycle is supposedly spent on apple trees. The males, appearing in late fall, are winged, resembling the migrants, but the true females are wingless. The eggs of this species are laid near buds rather than on the open bark. Undoubtedly this is one of the most serious of orchard pests, ruining millions of dollars' worth of fruit. It is comparatively a newcomer in the Northwest, having been introduced in the egg-stage on imported nursery stock, but it is yearly extending its range and destructiveness.

The Alfalfa or Clover Aphis has a more complicated life history. In early spring this species is an orchard insect, developing from eggs usually laid on apple trees. The stem mothers are greenish, mottled with red, and hatch very early in the season. As before, there is the usual second generation of wingless, parthenogenetic, viviparous females, followed by the winged third generation. These migrants leave the winter host plants to seek clover or alfalfa, and their pinkish colored descendants are destructive summer pests of these field crops. In the fall of the year another generation of winged lice appears, the returning migrants, which seek the orchards, and there give parthenogenetic birth to the sexed males and females. Here is exhibited Nature's further provision to take care during the winter of a field insect which otherwise would perish in excessive numbers if remaining on the ground.

It is extremely difficult to trace the wanderings of migrating plant lice, so the wonder is that students have already learned the life histories of the large series of species known. Some of our commonest species lead a dual, or better a multiple, life, devastating a large number of plants. The commonest peach aphid has a list of a hundred summer plants, some roadside weeds and some growing in our gardens. The hop aphid winters on plum trees, or where they cannot be found, the returning migrants of the fall select cottonwoods or willows. The wheat aphid survives the winter on apple or other trees. It would therefore follow that the simplest way of controlling the

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aphids of wheat, alfalfa or hop fields would be to destroy their stem mothers in nearby orchards.

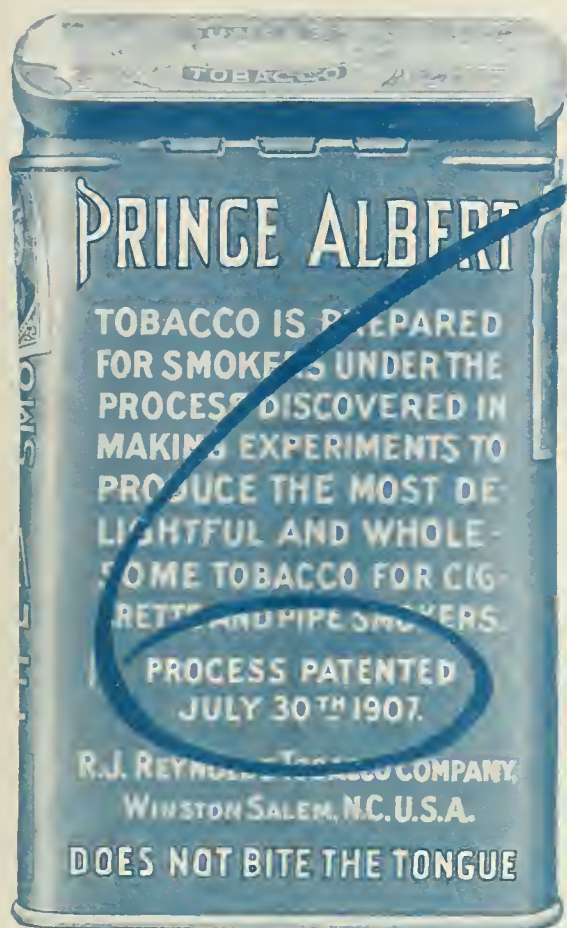
On the other hand, the life histories of many important species are imperfectly known. Where do the winged cabbage lice migrate in the fall? Do the extremely few eggs left by the black cherry aphid on cherry trees represent the only method of carrying this species over the winter? If so, why do not the lice appear in earliest spring, or why cannot this insect be controlled by winter sprays destructive to aphid eggs? Does the woolly aphid of the apple necessarily spend the winter as hibernating individuals on the roots, or do our Western specimens follow the recently-discovered routine of migrating to elm trees to deposit winter eggs? Some of these puzzles are intimately correlated with methods of treatment and should be solved as soon as possible.

The best single material found to control aphids is nicotine, which is now readily obtainable on the market in concentrated form. The usual 40 per cent nicotine sulphate is fatal to plant lice when diluted approximately one part to one thousand. The addition of soap at the rate of a pound to one hundred gallons vastly improves the use of nicotine as a summer spray. Spraying should be undertaken before the aphids have curled the leaves or it becomes impossible to wet all the insects with this contact spray. If only a few are missed the prolific insects increase in a few days to even greater numbers than before. The same material may be directed against the sexual egg-laying females in the late fall of the year after the fall migrants have returned to the trees.

Sulphur-lime is generally accredited as a valuable winter treatment for aphid eggs. While orchards regularly sprayed with sulphur-lime are freer from aphid injury than those unsprayed it seems that the benefit comes principally from the after effects on the hatched stem mothers, for aphid eggs hatch apparently as well whether sprayed with sulphur-lime or not. This is largely true also in the case of oil spraying. The addition of nicotine to sulphur-lime, however, produces a spray fatal alike to eggs and precocious stem mothers, and as the combination is more effective against scale insects and orchard mites it probably is a practice worth while. The standard formula designed for application when buds begin to swell calls for one gallon 40 per cent nicotine concentrate, seventy gallons full-strength (33%) sulphur-lime and nine hundred and thirty gallons water. To this no soap should be added.

Aphids on ornamental plants or on city trees can usually be successfully combated by using the garden hose with water under pressure. When the insects are forcefully knocked from the plants they rarely recover.

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SEBASTAPOL APPLE GROWERS' UNION
MOSIER FRUIT GROWERS' ASSOCIATION
WENATCHEE VALLEY FRUIT GROWERS' ASSOCIATION
YAKIMA FRUIT GROWERS' EXCHANGE
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E. E. SAMSON CO., North Yakima
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NEW YORK

OUR MARKET

THE WORLD

BETTER FRUIT

VOLUME X

APRIL, 1916

NUMBER 10

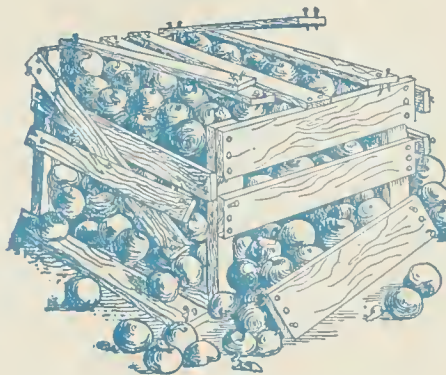


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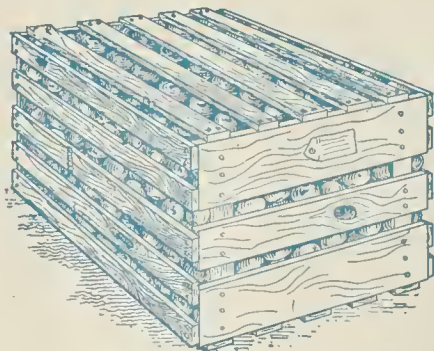
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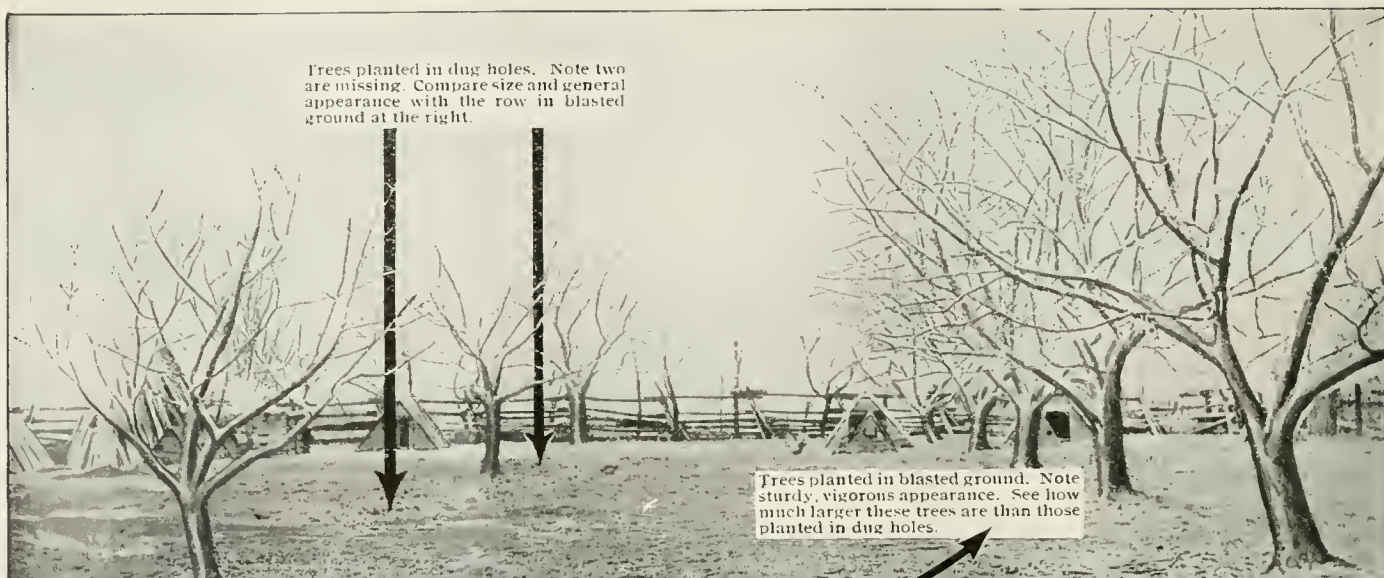
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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



Trunk of tree planted in blasted bed. Hardpan broken up, giving roots ample room for development.



Trunk of tree planted in same soil without blasting. Note how hardpan has forced roots to surface and observe effect of lack of food.

BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

League-State Inspection System

By O. T. Clawson, Inspector, Wenatchee, Washington

DURING the winter of 1914-1915 there developed in the Wenatchee Valley an organization of growers known as the Wenatchee North Central Washington Growers' League. This is a non-partisan organization of growers, with membership in all fruit-selling organizations and in all communities, including in its rolls a large per cent of the ranchers of the district. This league was formed as an agent of the organized growers in dealing with selling agencies operating within the district. The first aim of the league was the establishing and enforcing of a standard grade and pack for the Wenatchee district. The horticultural code of the state specified the interpretation of grades and made possible the enforcing of those grades, except that no provision was made for financing a corps of inspectors sufficient to carry on the work.

A contract was entered into between the Growers' League and the shippers of the district whereby the latter agreed to pay to the league one cent a box on all apples shipped by them. The fund so established to be used for the establishment of a system of uniform inspection. All the fruit organizations and agencies except two entered into this agreement, thus guaranteeing almost universal support from the agencies. The bankers, business men and newspapers of the valley gave the movement their unanimous support. It was largely through this loyal support that the move was able to survive and accomplish the work that has been done. With this assurance of financial and moral support this office was given the task of developing a plan of inspection to be effective over four counties. The plan as developed was an outgrowth of a combination of ideas and plans, and meant to cover as nearly as practicable the recognized value of advisory field work and the absolutely essential final check of warehouse inspection and check inspection for the development of uniformity.

The district was cut up into ten subdivisions, the boundaries of each determined by location and points of shipment. Over each of these subdivisions a field inspector was put in charge, and where deemed necessary assistant field men were supplied. In every case the field man was a trained horticulturist and with but one exception had had considerable experience as an inspector. These men passed examinations under the State Department of Agriculture and received certificates of

authority giving them full power to enforce the horticultural code of the state. Within his particular territory each man was given complete authority except as regarded the inspector at large and any check inspectors sent into the territory. All other inspectors working within the territory were under his direct orders and supervision. The field inspectors, each furnished with a Ford car, began work July first, making an orchard survey and crop estimate for the district, and during the month of July and the first half of August covered every commercial orchard in the four counties. They not only secured the desired information but were able to give the orchards of the district the most complete inspection they have ever had and to advise with the ranchers as to the solutions of their various troubles.

No attempt was made to cover the inspection of soft fruit. During the early part of the shipment of apples the field inspectors were able to pass upon all fruit going out of each district without extra help. As the work increased additional men were placed in each district under the field man's supervision, until during the height of the season there were fifty-three men on the force. Where there was sufficient tonnage passing through one warehouse to justify it, the complete time of one inspector was given that warehouse. In a few of the larger warehouses it was found necessary to use two men continuously throughout the rush. Wherever possible, however, each man was used to cover more than one point, in this way permitting a reduction in the size of the force and developing greater uniformity among the different shipping concerns.

Preceding the main rush there was considerable shifting of inspectors in order to increase the uniformity of action and broaden the viewpoint of each man, as well as to eliminate the likelihood of personal preferences and influences. With the coming of the rush the shifting of inspectors was practically discontinued, and the work of field inspectors, check inspectors and conferences depended upon to keep the grade as uniform as possible throughout the district. In any warehouse where more than one inspector was employed, one of them was the superior. Each shipping point requiring more than one inspector had one of them designated as chief and his decision had preference over any warehouse inspector, but in turn was subordinate to that of the field inspector,

and his in turn to the check inspector and the inspector at large. This provided a regular gradation of authority and a correspondingly well-developed system of checks. In Wenatchee, Cashmere and wherever else it was possible for the inspectors to get together, weekly meetings were held for the discussion of topics of common interest.

The supervisory work and check inspection of the field man was but a portion of his duties. Perhaps his most effective work was that of advising and assisting the ranchers in putting the fruit up to the standard desired. Any fruit rejected at a warehouse was reported to the field man operating in the district and it was his duty to visit the packing shed of the unfortunate or erring rancher and show him the difficulties with his grade, so that there need be no repetition of the rejection. In turn the field man kept his warehousemen posted as to the conditions found at the ranches. Each warehouse inspector was duly appointed by the State Department with jurisdiction over grade and pack. A certificate of authority and a badge denoting such were given each man. A stamp was furnished him with a number corresponding to the number of the badge. Each box inspected by any man was stamped with the number of the inspector and the date of the inspection. The same was required of check inspection and inspection in and out of storage so that any inefficiency could be traced directly to the responsible party. Certificates of inspection were made in triplicate for each car, one being sent to the league office for future reference and the first two being given the shipper. One of these two was generally attached to the bill of lading and the second retained for the shipper's files.

In general the results have been very satisfactory. The season's experience has disclosed some phases of the system which will need slight remodeling. The field force should be increased, and at least in remote districts be given the added duty of passing on the fruit before delivery. This method was tried in one district this year and the results were such as to indicate that it can be made entirely feasible. Whenever the field inspector examined and passed a bunch of fruit he stamped all of the boxes rather than merely the boxes opened. When the fruit came into the warehouse all unstamped boxes were known to be uninspected and were examined at that point. The stamped

ones were subject merely to check inspection.

A corps of men should be placed in the field by March first and maintained throughout the growing season in order to help in preventing the production of inferior fruit rather than merely to prevent the sale after it is once produced. It is believed that an efficient corps of men will be placed in the field

at that time. Central packing sheds are being advocated and several give promise of starting operations next year. The development of the central packing-shed idea will mean the simplifying of inspection, economy to the grower and a gilt-edged product. Two such have been operated successfully this year and will expand quite extensively next year.

Bridge Grafting Fruit Trees

[Office of Information, U. S. Department of Agriculture]

BRIDGE grafting, the use of scions or small limbs to connect the cambium above and below a large wound or girdled strip, may be practiced successfully on almost any kind of fruit tree that can be propagated readily by grafting. It is used more often with the apple than any other fruit, but pear trees often are treated in this way, especially in certain sections. There seems to be no reason why the method should not also be successful on plums and cherries, according to Farmers' Bulletin No. 710, Bridge Grafting, just issued by the U. S. Department of Agriculture. Peaches, however, graft less readily and there may be some question as to the usefulness of the method in the case of this fruit. While seldom used on shade or other ornamental trees, the author, W. F. Fletcher, writes that this method of grafting probably would prove successful in overcoming certain types of injuries to them.

Mechanical injuries which may be remedied are usually inflicted by animals, by burrowing insects or by implements carelessly used. Various diseases, such as pear blight, also cause local injuries which may call for bridge grafting. The trunks of pear trees are not infrequently completely girdled and killed by pear blight. Bridge grafting, if done in time, however, may save the tree. The method also is useful when large areas of bark have been killed by sunscald or other troubles. The author of the bulletin points out, however, that protection of trees against rabbits and mice and disease is, of course, better than having to bridge graft to overcome damage.

To be effective, bridge grafting should be done in the spring before growth starts, though sometimes it can be done after growth starts if dormant scions for the purpose can be secured. Prepare the wound in the tree by cutting away all dead tissue and thoroughly cleansing the injured parts. If possible, sterilize by washing with a solution of bichloride of mercury, copper sulphate or some other antiseptic. The irregular edges of the bark above the girdled tract or wound should be cut back into an even edge, far enough from the wound to make certain that healthy cambium is under the bark. For the grafting, select scions from wood of the previous season's growth, either branches which grew the preceding season or watersprouts that are only a year old. The scions should be

a little longer than the space which is to be bridged, so they will arch slightly over the central part of the wound. Bevel the scions at each end on the same side of the scion with a long sloping cut so that the wedge-shaped ends thus formed will be relatively thin and permit their being thrust well under the bark without danger of separating it unduly from the cambium at the points of insertion. The placing of the scions will be facilitated if the bark at the margins of the wound is slit for short distance at the points where the ends are to be inserted.

In placing the scions it is of the greatest importance that the cambium of the scions which is exposed in the sloping cuts at the ends be brought into intimate contact with the cambium that lies under the bark at the margins of the wounded area. The union of scion and tree can occur only where the cambium layers of the two come together. The scions may be secured in their proper positions, if need be, by driving a small nail through each end into the trunk. This will aid in drawing the cambium of scion and trunk closely together. The operation is completed by thoroughly covering the area occupied by the ends of the scions and the margins of the wound with grafting wax, strips of waxed cloth, or by some other means that adequately will prevent these parts from drying out. Some operators cover the entire wound, scions and all, with melted wax. Where the bridged portion is below or near the ground, many operators conserve moisture by covering the grafts with earth.

Where the wound is so large as to make ordinary bridge grafting impossible, another method of bridging may be used. Two-year-old trees are planted about the base of the injured tree and their tops grafted into its trunk above the girdled space, which has first been cleaned as in the other method. As the tops of the small trees are too large to manipulate readily in the manner described for scions, V-shaped vertical grooves extending through the cambium are cut just above the wounded area in the bark of the tree to be treated. The tops of the small trees are shaped to correspond with these grooves. The two are then accurately fitted together in such a manner as to bring the cambium of one into contact with that of the other. Small nails may be driven through the tops of the trees into the trunk, to hold

the parts firmly together. The wounds incident to joining the tops of the small trees to the trunk of the large one should be well covered with wax, to prevent drying out. Sometimes cord is tied around the trunk to aid in holding the tops of the young trees in proper position.

Contact Poisons and Green Apple Aphis

[Office of Information, U. S. Dept. of Agriculture]

THE effectiveness of different contact poisons both alone and in combination with other substances in killing the green apple aphis has been made the subject of extensive field and laboratory tests by the entomologists of the United States Department of Agriculture as reported in Department Bulletin 278. Extensive experiments were made with 40 per cent nicotine sulphate, kerosene emulsion, anthracene emulsion, naphtha soap, laundry soap and fish-oil soap, both alone and in combinations. In certain cases in order to provide a stomach poison in combination with an aphicide, arsenate of lead was used in connection with the nicotine sulphate, and both arsenate of lead and arsenate of calcium were used with kerosene emulsion without lessening the killing action of the nicotine sulphate on aphids. It was found, however, that where arsenates are combined with kerosene emulsion they should not be mixed and allowed to stand for over a day or so, since there is a slight breaking down of the soap. As the specialists point out, insecticides in general should not be combined until they are to be used.

According to the results of these experiments a 10-per-cent kerosene emulsion should prove effective against the green apple aphis. The kerosene emulsion made either with 66-per-cent stock, 10 per cent, or with naphtha soap and cold water, seemed to kill all the green apple aphids. The 40-per-cent nicotine solution, with a dilution up to 1 to 2,000 combined with soap, were likewise effective aphicides. Anthracene emulsion, 3 per cent, gave satisfactory control, and at this strength caused no foliage injury. Anthracene emulsion, 5 per cent, burned the foliage badly. The kerosene emulsions under 10 per cent were not satisfactory, neither were the soaps at the strengths tested, except that fish-oil soap, 5 to 50, killed 90 per cent of the aphids. Laundry soap, 3 to 50, was effective against the young aphids only. Arsenate of lead alone, as was to be expected, had little or no effect upon the aphids. The combination of arsenate of calcium with kerosene emulsion is not a desirable one, since an insoluble calcium soap is formed, thereby releasing some free kerosene.

Strawberry growers of Kennewick and Richland have agreed to a consolidation and will market all of their berries through one selling concern, thus cutting out self-competition, a step in the right direction. More of this work is in order, and when more of it is done fruitgrowers will realize better prices.

Concerning the Pocket Gopher and Destructive Habits

By Theo. H. Scheffer, Assistant Biologist U. S. Biological Survey

THE pocket gopher is an animal of wide distribution in the United States, being found almost anywhere west of the lower course of the Mississippi River and the eastern border of its valley in the upper course. There is also an isolated group of these animals in parts of three states on our southeast coast. The small ground squirrels of the prairies and the true moles are sometimes locally known as "gophers."

The gopher burrows in the soil of wild lands and cultivated fields, constructing a labyrinth of tunnels that have no permanent exits above ground. The work of extending these runways is usually done at night or in the early morning and late evening, when, at intervals, the busy little animal dumps on the surface of the field the loads of earth it has brought up, through short lateral gangways, from its excavations below. These accumulations of soil soon assume the proportions of conspicuous mounds ranging in bulk from

a few quarts to more than a bushel of dirt. Some of the Pacific Coast moles heap up similar mounds, but a little study of detail will enable the observer to readily distinguish them from those constructed by the pocket gopher. The former are built up, volcano fashion, by successive upheavals beneath and through the center of the mound, the earth, if not too dry, falling down the slopes in the form of the plugs that were forced up from the tunnel as through a crater tube. The earth mounds of the gopher, on the other hand, are more or less semi-circular or fan shaped in outline, with the plugged opening through which the dirt has been carried out, on one side. In the construction of these mounds each successive load of earth was piled on top of the one previously brought out, or to the right or left of it. Associated with the mounds built by the mole there may be upridgings of the sod or soil crust where the little animal has plowed along just beneath the

surface in search of food. The runways of the gopher are all too deep down to produce such ridges.

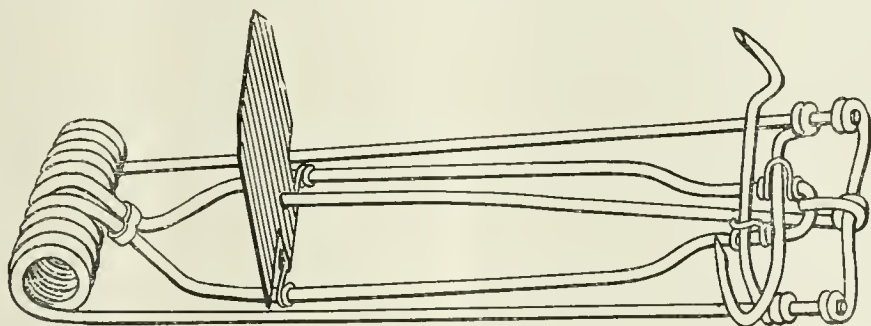
The gopher is not a prolific breeder. It rears young but once a year—in the early spring of our temperate latitudes. The number of young at a birth will average four or five. They grow and develop fairly rapidly and by fall are scattering out and digging runways for themselves.

The natural food of the pocket gopher consists mainly of the roots and underground stems of the plants growing wild in its habitat. The search for these results in the long and devious windings of the gopher tunnels we find in our fields. Stems and leaves of certain plants are also cut off above ground and pulled down into the burrows to serve as food. In some parts of the country, at least, considerable quantities of root sections are stored in underground chambers connected with the tunnels. These are usually for winter use, though there may be other times when stores are drawn upon because of temporary food scarcity.

With the cultivation of the soil by man has come the substitution of various edible roots and tubers for those of the original wild plants destroyed by the plow. These new supplies being usually more abundant and constant than formerly, the gopher has found conditions of life easy and as a result has, in recent years, greatly increased in numbers in some agricultural districts. Following this increase such crops as alfalfa, clover, potatoes and garden truck have suffered much from attacks on their root systems and from the presence of the mounds, which cover up parts of the crops and interfere with harvesting.

Much damage has been done to young orchards by the pocket gopher. Instances might be cited where entire acreages of considerable extent have suffered the loss of almost every tree as a result of the roots being gnawed off. Nursery stock in the field is also at times seriously damaged in a similar way. In the irrigated fruit districts, too, the tunnels of the gopher penetrate the ditch banks, causing waste of water and often serious breaks and washouts when the smaller leak has not been discovered in time to stop the outflow.

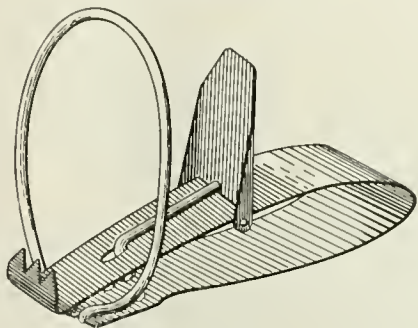
All that is required to keep the gopher situation in hand in any community is a well-directed campaign of poisoning or trapping at the start, followed by reasonable vigilance and co-operation with neighbors. The animals are easily trapped, and will take certain poisoned baits in a manner that indicates the possession of little shrewdness or cunning in scenting out danger along this line. Poisoning and trapping may be followed successfully at any time when the gophers are active in throwing up fresh mounds a



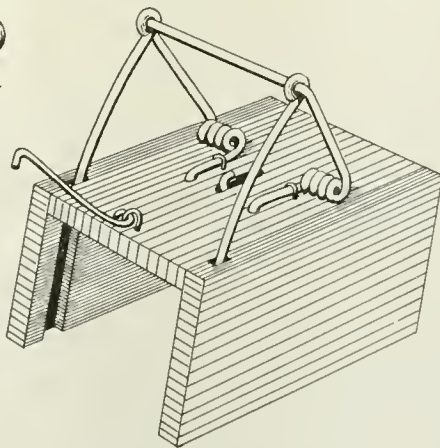
A very efficient and simple trap for pocket gophers.



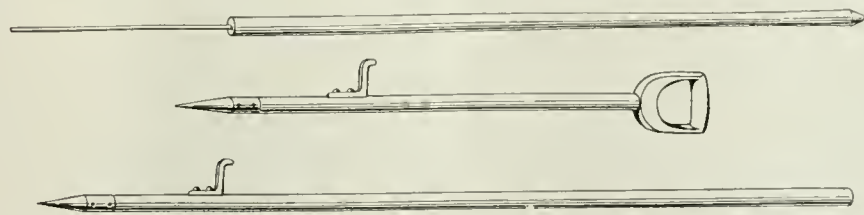
A strong garden trowel, useful in trapping or poisoning operations.



The "Ring" type of trap, with band steel spring.



The "Box" type of gopher trap.



Prods used in locating and effecting entrance into the underground runways of the gopher.

dry period or one of hard freezing weather being least favorable for the work.

The very best poisoned bait we have so far discovered for pocket gophers consists of sections of sweet potato, parsnip or carrot treated with powdered strychnine. The vegetable used should be cut into pieces about as thick as one's little finger and approximately an inch long. It is best to mix the strychnine with about one-tenth its bulk of saccharin in order to partially disguise the bitter taste of the poison. The mixture may then be put into a pepper box and dusted over the bait while the pieces are still fresh and moist. One-sixteenth of an ounce of strychnine is sufficient for two quarts of the bait. Stir the pieces about while dusting on the poison so that the latter may be evenly distributed. If the bait has dried so that the poison will not readily adhere wet the cut vegetables and then drain until the pieces are in the proper condition. The bait must not be sloppy.

Another very good way of preparing the bait is to stir the powdered strychnine and saccharin thoroughly into a small quantity of rather thick laundry starch, made up just as for starching clothes and allowed to partly cool before using. Pour this over the bait and stir until all the pieces are fully coated with the poisoned paste. Not more than one-third of a teacupful of the prepared starch will be needed to coat two quarts of the bait. It is best to let the starch coating dry for a short time so that soil particles will not adhere to the bait when it is put out in the field.

In putting out the bait entrance into the gopher's burrow may be effected by the use of a sharpened prod about an inch in diameter. Types of such prods are illustrated herewith. The one that is made of a broom handle, with a piece of one-quarter or three-eighths-inch iron rod fitted into the large end and projecting about twelve inches, will give good satisfaction in ordinary soils. Both the rod and the handle should be bluntly pointed. The former is used as a seeker, the latter for enlarging the opening where poisoned bait is to be introduced into the gopher's runway. To penetrate hard soils a prod with a footrest attached may be needed. The course of the burrow can be located by prodding the soil in a line between two adjacent mounds, or, if the pile of earth has been freshly thrown up, a better plan is to push the dirt aside with the foot and find the lightly-plugged lateral leading into the runway. In either case push the bait well into the opening. It is immaterial whether the latter be closed or not after introducing the bait. It is good practice to obliterate all mounds with hand rake or drag of some sort a few days after putting out the poison, so that if any gophers escape the first attack the new mounds they construct may be readily detected.

Gophers are more easily trapped than perhaps any other animal pest of

our agricultural districts. The ordinary type of steel trap, No. 0, may be used, set either in a lateral or in the main runs; but a specially designed gopher trap will usually give much better results. Set singly, these traps must be placed in the lateral, or short branch leading from the main burrows to a point where dirt has been recently pushed out. If entrance is effected into the main tunnel two traps must be used, one facing each way. One or more types of gopher trap may usually be found on sale at a local dealer's. The simpler and more compact the device the better. Those made entirely of metal are to be preferred to those having some wood in their construction. Explicit directions for setting any particular make of trap are, or

should be, furnished with the trap when sold. In placing either one of the metal traps shown in the illustrations accompanying this article, find a freshly-constructed lateral from the gopher's burrow to a new mound of earth, as directed in the account of poisoning operations. Enlarge this short side branch by hand or with the plant trowel and push the trap back for its full length, "sawing" it into the ground so that it will remain in position when the gopher approaches. These small traps will need to be secured by wire and stake to prevent their being dragged back into the windings of the runway. The box type of trap is intended to be set snugly up against the end of the open lateral from a burrow.

Disposal of Fruit By Auction

By Arthur M. Geary, Portland, Oregon

FOR over a hundred years most of the foreign fruits and a large percentage of the vegetables consumed in London, Liverpool, Glasgow, Hull, Bremen, Hamburg and a number of other European cities have been sold under the hammer. In this country auction selling of fruit began at about the time of the Civil War. Sailing vessels from Southern Europe and the tropics, loaded with oranges, lemons, bananas and other fruits, were sold to the trade of Boston, New York, Philadelphia and other cities as they gathered on the wharves,—often the auctioneer standing upon a stand under a raised umbrella. Horatio Harris, the founder of H. Harris & Company of Boston, and Edward Brown, founder of Brown & Seecomb, auctioneers, which is one of the three firms now operating in New York, were the pioneer auction sellers of the United States.

In New York today the three auction houses own a ten-story building at 204 Franklin Street, where Sicilian lemons, Spanish Almeno grapes, Florida oranges, and grapefruit and pineapples from Cuba and the Isle of Pines are sold at auction. Samples of cargoes and cars of these fruits are put upon display in the Fruit Auction Building. From estimates of the quality and value of these samples, the trade of New York, composed of seven or eight hundred jobbers, brokers, hotel agents, large retailers and commission merchants make their bids in the sales auditorium that are found on the floor above. A great many of the offices of firms connected in some way with the fruit business are located in the Fruit Auction Building.

The bananas are the only fruits that are still sold after the fashion of the sixties. As bunches of bananas are carried from the holds of the vessels and loaded upon wagons, buyers stand around and judge of the quality of the fruit. When a wagon is loaded, the auctioneer, who operates from the bridge of the ship, auctions it off to the highest bidder. The United Fruit

Company, during the last few years, has been using this method of distribution in New York.

The fruit from the Pacific Coast that is consumed in the New York district, which embraces a population of eight millions or more, is unloaded on Erie Pier, which is also known as Pier 20. The great dock is 800 feet long and two hundred feet wide, heated by steam pipes in winter and cooled by a ventilation system in summer. All the fruit cars from California, Oregon, Washington, Idaho and Montana arrive at the terminal yards in Jersey City and are towed across the Hudson River on scows during the night to Erie Pier. Here great gangs of men work through the night at unloading and opening sample boxes. Different from the practice at the Auction Building, whole cars are placed where the trade can view them. If a buyer desires he can open all the boxes, but generally he is satisfied with viewing the opened sample boxes.

When the trade of New York is turned loose among the fruit in the morning, every car and every lot of fruit in every car can quickly be located by numbers and description found in the daily catalogs that are distributed free. The actual bidding on Pacific Coast fruit takes place in the two sales auditoriums, located on the second floor of Erie Pier.

One of the principal functions of the auction houses is to advance cash to the agents of the growers, whoever they may be. Within twenty-four hours after a car is auctioned off, a check is handed to the agent who had the car sold, and there is no reason generally why the check should not be mailed on to the grower or the grower's association at once. The auction houses must wait for their money, as the bulk of it is sold on ten, fifteen and thirty days' credit. By a carefully built-up system of extending credit, the auction houses handle millions with the loss of but a few hundred dollars from bad bills.



The particular auction auditorium on Erie Pier where the pears, cherries, prunes, plums and grapes that are shipped to New York from the Pacific Coast are sold.

The California Fruit Growers' Exchange, which handles over sixty per cent of the orange and lemon crop of California, have made the auctions their exclusive means of distribution in twelve large cities. If a jobber who lives in one of these cities desires to buy a car f.o.b. in California or in any way except through the auction, he is disappointed. The Exchange insists that he compete with the little jobbers, the brokers and large retailers and aid them in the competition that sets the price. The California Fruit Distributors, who handle forty per cent of the grapes, pears, cherries and plums shipped from California, follow the same policy in a still greater number of cities, as do the Mutual Orange Shippers' Distributors, which is the largest rival of the Exchange in the citrus fruit-shipping business of California.

The Florida Citrus Exchange also uses the auction system in selling its fruit,—oranges and grapefruit. The

rest of the tonnage from Florida is sold both at auction and at private sale in the large cities. A number of the jobbing firms of New York and other cities make a business of buying Florida oranges f.o.b. and selling them through the auction. In such cities as Boston, Philadelphia, New York and Pittsburg it is estimated that eighty to eighty-five per cent of the Florida oranges and grapefruit are sold at auction, the rest being handled by the jobbers through their own stores.

The great bulk of both the box and barrel apples are now sold at private sale through the stores of the jobbers. The apples from the Northwest arrive on Erie Pier along with the fruit which are sold at auction. Here they are taken charge of by the jobbers and commission men.

In Boston, about a third of the cars of apples shipped there this season were sold at auction by H. Harris & Company, the jobbers handling two-thirds through their stores. In New

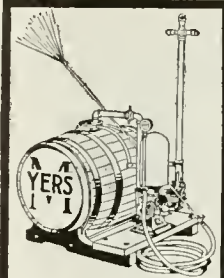
York and Philadelphia only occasional cars of apples were disposed of under the hammer during this last winter. In Pittsburg, Cincinnati, Kansas City and a number of the largest interior cities occasional cars were sold under the hammer.

The Department of Markets of New York, under Director John J. Dillon, has opened an auction for barrel apples. Sales were held in the orchards at Gardiner and Red Hook last September and at the Auction Building daily during the winter. The percentage of New York barrel apples disposed of in this way during the past season, which is the first of its operation, has not been large.

A news story is current, although not verified, that the Rogue River fruitgrowers are willing to make some arrangements in connection with Hood River for the purpose of marketing the Newtown crop in an endeavor to cut out unnecessary competition between these two districts on their Newtowns, which is the principal variety grown in both sections.



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Spraying Controls Peach- Leaf Curl

Oregon orchardists are given assurance that correct spraying methods will control peach-leaf curl. The kind of spray, time and methods of application, and other important data are outlined in the following paper by H. P. Barss, head of the Plant Pathology Department of the O. A. C. Experiment Station:

"Peach-leaf curl is a disease which undoubtedly causes thousands of dollars of loss each year in the State of Oregon. Practically all of this loss is unnecessary, since this disease can be satisfactorily controlled with one spraying given at the proper time of year, as the experience of a great number of growers in all parts of the state indicates. This article is written for those who have failed in the past to control this disease and for those who will have this disease to contend with as their newly-planted orchards get a start. The writer is confident that, barring accidents, any peach grower can control this disease to his own satisfaction if he follows carefully the directions set down in this article.

"Peach-leaf curl is a disease caused by a fungous parasite. The infections of this fungus occur early in the spring just as the tender young leaf points are emerging from the buds and the infections are particularly bad when the weather is moist and warm just at this stage. Some varieties of peaches are much less seriously affected than others. When the delicate infection threads of the fungus have penetrated into the new leaves they

spread all through the leaf tissue and the leaf becomes distorted, abnormally thickened, and of an unnatural color. The whole leaf may be affected; in fact, a whole twig may be affected, but in other instances there may occur only a few separate patches of leaf surface affected by the disease. By the middle of the spring the surfaces of these distorted leaves become powdery with the spores or reproductive bodies of the fungus which are being discharged at this time. These are carried by air currents all through the orchard and will eventually result in the infections of the next season. After discharging the spores, the leaves that are affected shrivel up and hang, dead and brown, to the branches for a long time. Great injury is done where a large percentage of the leaves on a peach tree are affected even though the tree may put out a new growth of leaves. The vitality of the tree and the quality and yield of fruit are greatly reduced. Furthermore, a tree may die from the effects of the disease when it suffers two or more successive severe attacks.

"Years ago it was found that by spraying the trees thoroughly with bordeaux mixture 4-4-50 or with lime sulphur 1-10 just before the buds began to open, this disease could be controlled. A good many growers, however, wait until the last minute before making the application and in a great many cases find the weather conditions such that spraying is impossible at that time. Consequently delayed application is often made very soon after the buds begin to come out, but unfortunately in such cases a great part of the infection has already taken place and

practically no beneficial results come from this delayed spraying.

"It has been found that while spraying immediately before the buds begin to open does control the leaf curl, yet a spray given a week or more before will have exactly the same effect. Recent experiments by the Cornell University Experiment Station, even, indicate that spraying any time after December 1 will be effective if thoroughly done. Experiments are now under way at the Oregon Experiment Station to determine whether or not this is true under Oregon conditions as well. Whatever the results of these tests may be, it is the experience of Oregon growers that a thorough application given within two weeks before the opening of the buds will have successful results. We recommend, therefore, at the present time, that peach growers spray their trees in February a week or two before the buds are expected to begin to come out.

"If the presence of San Jose scale in the orchard is suspected, use lime sulphur 1 to 10. If not, use bordeaux mixture 6-6-50. Successful control, however, cannot be expected unless the work is thoroughly done. Every bud must be covered with the spray material. This is not an easy task, but the results are worth the effort. A mist spray under considerable pressure will generally give the best results."

Lead Arsenates Differ

Lead arsenates are sold for spray purposes as acid or lead hydrogen arsenate and also as basic lead arsenates. These materials differ in some essentials to the extent that users of them in practice should be able to distinguish them, says Professor H. V. Tartar, who has carried out the most exhaustive research work with arsenates of lead so far reported in this country. Only by knowing something of their identity and properties can the user be able under difficult and special conditions to avoid disastrous results. Some of the differences are pointed out as follows: The acid salt is fluffy, somewhat like wheat flour, and is usually without crystals, although under certain conditions crystals appear. The particles are of lower specific gravity and settle from the water or other liquid of the spray more quickly than the basic forms. The basic form is granular in appearance and has not been observed to crystallize. Although the size of the separate particles of both is practically the same, the basic form particles have a tendency to collect into groups, thus becoming heavier and settling more rapidly.—O. A. C. Bulletin.

The Wenatchee district, according to the Growers' League, which has kept a careful account of the number of cars inspected and shipped, reports that the Wenatchee district, up to the middle of February, has shipped 4,156 carloads of apples.

Hood River Apple Growers' Association, on February 23rd, reported their tonnage for the season 1915-16 to be 374,419 boxes. Shipped to date, 315,455 boxes; on hand, 28,953 boxes, or less than 50 carloads remaining.

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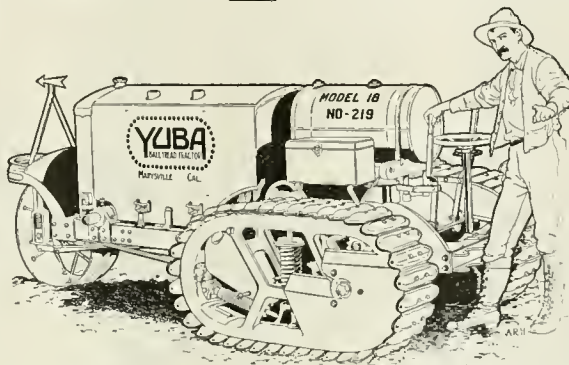
Success means getting the soil in good humor, so it will produce big crops and will not be exhausted.

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The Codling Moth

Presented at California Fruit Growers' Convention, Palo Alto, July 28, 1915, by A. L. Melander, Pullman, Washington

HOW many times shall we spray for the codling moth? That is the question. Whether we believe in strong or weak spray, misty or driving application, low or high pressure, neutral or acid arsenate, and whether we supplement the spraying with other control practices, such as cultivation, thinning and banding, we are all interested in how often, or rather how few times, and when to spray. Ten years ago fruitgrowers in Washington were averaging seven summer sprayings for the codling moth, using hand pumps at a pressure of fifty pounds, Vermorel nozzles, long spray poles, strong paris green and spraying from the ground, and getting 85 per cent of worm-free fruit to repay their trouble, the culls being for the

most part calyx wormy. Contrast with this method the system which these same growers now practice: Power sprayers maintaining 250 pounds pressure, clipper nozzles set with a crook-joint to 8-foot rods, weak arsenate of lead and the spraying done from an elevated platform. The two methods have little in common beyond aiming to check the codling moth, yet the growers now are able to eliminate half their applications and add an extra 10 per cent to their crop. The change resulted simply from applying the principles of efficiency to this phase of orchard management.

A decade ago when many growers were spraying twice each month, we showed that in the North the codling moth worked in well-defined periods.

In the irrigated districts no apples became infested during the first half of July, in which case a spraying on July 1st was so much effort wasted. This eliminated one spraying. The substitution of arsenate of lead for paris green gave an adhesive material good for a month or more, thus eliminating other sprayings. Hence a spraying when the first brood hatched, another after mid-July at the onset of the second brood and another about September 1st for late second brood and a partial third brood, took care of the difficult part of the program. The object of these three application is to coat the fruit with poison in advance of the hatching of the worms so that the first meal taken by them will be their last also. Apparently then these



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three sprayings should protect the crop. In practice, however, it has been found that they come far from fulfilling this purpose. In one experiment even, several years ago, we found exactly as many worms when these three sprayings were given as when no spraying at all was done. As the wormy apples were mostly entered at the calyx a spraying system to be successful must protect that part of the fruit. As far as the codling moth is concerned an apple consists of two parts: a large outside comprising the tough skin and a small, attractive retreat at the calyx end. That this retreat proves attractive the wormy apples of any unsprayed orchard will show. Sometimes as many even as nine out of ten worms will seek out this part of the fruit, which is the only part of the surface unprotected by an epidermis.

For a variable period, usually of about ten days immediately following

the blossoming of the trees, and at that time only, the calyx end of the apples can be poisoned. At that time the petals are out of the way, the sepals project widely open and most of the flowers which ultimately set fruit extend upward. The inner calyx, however, is protected by a close-fitting crown of about twenty curved, springy and hairy stamens. Since these stamens are stiff a penetrating spray is necessary to force the poison between them. This calls for a nozzle of the clipper type and for pressure. Since so many of the flowers point upward the spray must for the most part be directed downward. This calls for the crook-joint, and in the case of trees more than a dozen feet in height for the tower or elevated platform in addition. Since the time for this spraying is limited by the infolding of the sepals, there is no time for loitering. An unexpected spell of hot weather might close the flowers in three or four days. Hence the necessity again of high-pressure spraying, which is synonymous not only with efficiency but with speedy application as well. Some fruitgrowers overlook the fact that it requires a given amount of liquid to spray an orchard, whether applied at 50 pounds or at 250, and that at 50 pounds it takes a week do what 250 pounds accomplishes in a day. Penetration, therefore, is the keynote governing the calyx spraying,—a penetration nozzle, a penetration pressure and a penetration direction to the spray. Can the calyx cup be filled? Is it necessary to use a driving spray? Cannot excellent results follow the old method of using a mist application? Is not a driving spray wasteful or even injurious? These and a dozen other questions have been asked and answered.

Evidently there is a varietal difference in the structure of apple blossoms. Sometimes, as in the Baldwin, the stamens are very turgid and densely woolly, in which case it becomes practically impossible in orchard practice to force poison into the interior of every flower. Sometimes, as in the Rome Beauty, the blossoming is irregular, buds and old flowers occurring together. In this case the calyx spraying must be repeated. However, the application should be timed by those central flowers of each cluster which because most mature are the ones to set fruit. Usually the belated lateral buds can be ignored because ultimately they are thinned or drop off. Sometimes an orchard has a mixed planting of early and late varieties, which calls

for a repetition of the spray, for the spraying must be given when the flowers are in receptive condition. Sometimes, as in crabs, the flowers are thin stemmed and tilt over when hit by a driving stream. In all these cases it is difficult in orchard practice to fill the inner calyx cup and calyx wormy fruit must be expected. In the case of commercial Northwestern varieties it is not only possible but practical to fill every calyx cup and thus to destroy by means of this spraying alone the vast majority of worms that seek this part of the apple, whether they enter shortly after the spraying or not until the day of harvest. We have sorted the culls from many thousands of boxes of fruit, not only that experimentally sprayed but that also from the orchards of Western growers who have adopted this spraying system, and have invariably failed to discover calyx worminess. But on the other hand, in attempting to apply the system to New York conditions we have failed to penetrate into Baldwin apples, and, like other experimenters, have had 10 per cent or so of the wormy fruit entered through the calyx.

There has been much controversy as to whether or not the calyx spraying alone can protect an orchard. Abundantly it has been demonstrated in actual experience that this early spraying has given such satisfactory results that later sprayings would not pay for their application. Again, and perhaps even more frequently, other growers have failed to control the codling moth with repeated sprayings. There is no question that the calyx spraying is most important. Just how carefully or how poorly it is given will determine the loss at harvest. Numerically it should be worth as much more than all subsequent applications together, as the calyx worms exceed in number the side worms. Practically it is even more valuable, and for several distinct reasons. First, it undoubtedly destroys a certain percentage of leaf-eating worms which would have been side entering. Again, it is impossible to fill the calyx without wetting the sides of the blossoms, and this poison probably has some effect. But most important in the matter of practical control, late sprayings never afford their full expected benefit, for it is the instinctive habit of the codling worm to reject without swallowing such distasteful substances as the tough skin of the apple and with it the poison which coats this unnatural food.

For these and other reasons the most possible emphasis should be placed on thoroughness of the calyx application. The more complete the destruction of the early worms the fewer later-brood worms there would be with which to contend. Late sprayings at the best are unsatisfactory; they do not prevent "stings"; they are unsuited to waxy or oily-skinned varieties; they interfere with irrigation; they knock off fruit from heavy hanging branches; they are hard to time correctly; their effects are transitory and so they must

be repeated; they affect only the relatively few worms that miss finding the calyx end; they merely consume time, energy and money, for their actual benefit is small. This does not at all mean that late sprayings should be ignored, especially where thinning is not practiced, for sometimes they are highly essential. It means only that compared with the calyx spraying their combined value is small indeed.

How much does the grower risk who sets out to depend on the calyx spraying alone? The answer is that he loses his second spraying, but that need be all. The commercial orchardist offsets the second spraying by thinning during the time of the first brood, and when he also bands some of his trees he has a definite, double indicator of the number of worms escaping the action of the calyx application. If calyx wormy fruit is found it would be ill advised to depend on the single spraying alone, for it was not thorough. If all the worms are side entering he will have to make his own calculations. Generally speaking, he will have to balance the cost of the application against the following factors: a pair of codling moth have at most forty offspring; of these from four to sixteen or so alone can be reached by the late spraying, for the others enter at the calyx; of this limited number possibly half, but probably more, reject their first nibblings, and will enter the fruit in spite of the spraying; furthermore, whereas second-brood worms are scattered over several months, the effects of a late spraying wear off in a single month. Hence, for every first-brood worm that escaped there would be, roughly speaking, only about one or two second-brood worms that a later spraying could reach. The other eighteen or so would get into the fruit anyway or would be poisoned by the previous calyx application. Of course we all realize the danger of juggling with figures, but in actual commercial orchard experience these numbers are borne out in practice with surprising closeness.

Fruitgrowers generally feel uncertain as to exact dates for all but the first spraying and commonly depend on someone having a breeding cage to instruct them when to spray. Breeding-cage information is often misleading, for unless the cages are kept in the same environment as the insect the development of the codling moth is abnormal. Practically all of the first brood of codling moth are descendants of worms which spent the winter in the ground, the few exceptions coming from those over-wintering in rough bark, under bands, or in packing sheds. Obviously, the few worms above ground transform at a different rate from those a foot down in the soil, yet breeding-cage information is usually based on the easiest worms to obtain. A more exact determination can be had by watching for empty pupa cases on the soil beneath a wormy tree. The real beginning of the first brood of worms in the Northwest follows fully

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“—the motor that makes extra cylinders unnecessary”

So said an automobile expert after he had examined the Case 40, both in the shop and out on the highway.

You will say the same thing when you drive it on a heavy country road or up a steep hill, or on the car's 100,000th mile. We have built this car to earn the title of the 100,000 Mile Car.

CASE

The new Case 40, advanced in design and comforts, still retains all the basic engineering features which gave the earlier Case 40 such a splendid reputation.

What other car has such a pedigree as this new Case 40? Where can you duplicate this certainty of satisfaction? Made by Case-trained workmen in the Case plants (you know what this means to you), the Case 40 has behind it a reputation of nearly four-score years. One genera-

tion after another has found in Case products genuine satisfaction. The new Case 40 is bound to add to Case fame everywhere. You will admire its beauty. As you ride in it you will admire its comfort and performance.

Once you own a Case, you will be satisfied. There is no time like the present to learn about this new car, with 120-inch wheelbase, cantilever springs, room for seven and many other features, all for \$1090. Better write for catalog today.

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Tuber-Tonic } *Form*

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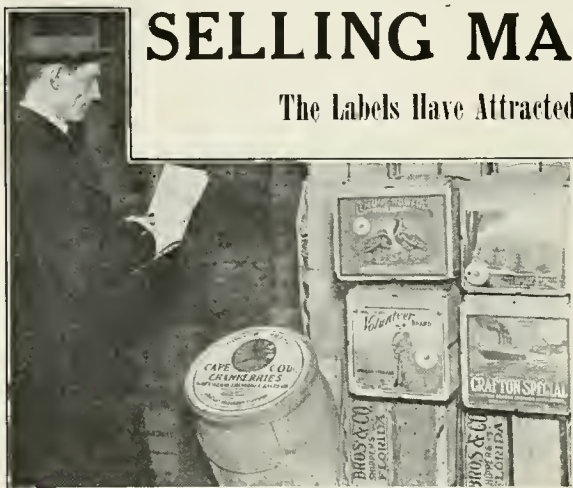
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six weeks after the calyx spraying, although precocious moths can be found during blossoming time. Although there is considerable variation in dating the first and second sprayings owing to fluctuations in spring weather year after year, yet by the time of the second brood the seasons average up with remarkable consistency. For instance, during four years at North Yakima the first worms of the second brood have hatched on July 19th, which fixes that as the calendar date for the third spraying. Therefore spraying dates for the third and subsequent applications, once determined, can be relied on in the future.

We have repeatedly had perfect results when using one pound of paste arsenate of lead to every fifty gallons, and have even carried the dilution to

one to seventy-five without lowering the efficiency of the spray. When the application is thorough two or more pounds to fifty gallons seem to gain nothing. Frequently apples whitened with spray become excessively wormy. It is not a concentrated spray, but a careful, uniform, thin coating that counts. Indeed, theoretically an increase in concentration might produce a decrease in efficiency owing to the selective feeding habits of the newly-hatched worms. By the same reasoning the poorer results following a combination spray can be accounted for, because the minute worms plausibly refuse to eat such unnatural and distasteful materials as bordeaux spray, lime, sulphur preparations, tobacco, soap or oils. By way of summary conclusion, the fight against the codling

moth hinges on the calyx application. Whatever the method of spraying, whether high or low pressure, or misty or coarse spray, the calyx application should receive the closest attention, for what is left undone then cannot be corrected by later applications.

Black Spot on Baldwin Apples

A correspondent from Slatington, Pennsylvania, writes the Department of Agriculture asking the cause of small brown spots that run almost to the core in the Baldwin and King apples. Zoologist H. A. Surface answers as follows:

"Your Baldwin apples are evidently affected by the disease known as Baldwin spot. This is a black spotting that attacks the Baldwin and also the Jonathan. It is in part prevented by spraying two or three times during the summer with the bordeaux mixture. Spray with bordeaux and arsenate of lead just after the blossoms fall, and again a month later. Use one pound of arsenate of lead, three pounds of bluestone and four pounds of fresh lime in fifty gallons of water.

"I am aware that some claim that this cannot be prevented by spraying, but the Department of Agriculture has done this in some of the demonstration orchards in this state and has had conspicuous and excellent results."

The "Why" of Gasoline Prices

Supply of crude oil increasing .6 of 1 per cent; consumption of gasoline increasing 27 per cent. Put very briefly, this is the why and wherefore of the advance in gasoline prices. It is the working of the inevitable law of supply and demand. In California oil fields last year there was an actual falling off in crude-oil production of over 14,000,000 barrels. The United States Geological Survey shows that the total 1915 production of crude oil increased only .6 of 1 per cent over that of the previous year. And yet 500,000 automobiles were put into use in the United States in 1915 and increased the gasoline consumption, for automobiles alone, fully 27 per cent over the consumption in 1914. Meanwhile thousands of gasoline engines and tractors are being put into service on our farms and ranches and depleting the available gasoline supply.

The January issue of the National Petroleum News—the organ of the independent producers—estimates that at least a half million new automobiles and trucks will be sold this season, so that in a few months not less than three million cars will be consuming gasoline. That will require a 30 per cent increase in gasoline production in order to maintain even the present balance between supply and demand.

Thus far this year production has run considerably less than normal. Just as was the case last year, the United States government suits against operators on unpatented lands is greatly limiting production and the severe January storms which wrecked hundreds of rigs in the California fields has further retarded production. The California State Mineralogist estimated a daily average loss in production of 40,000 barrels as a result of this storm damage.

Improved carburetors and improved methods of refining petroleum will undoubtedly relieve the gasoline situation from time to time, but in the final analysis the price of gasoline will be determined by the way the country's crude-oil supply keeps up with the ever-growing demand for gasoline. Just at present nature and the government are combining to limit the supply. Time may change all this and in the meantime we of the Pacific Coast can congratulate ourselves that we live handy to the California fields, where oil is still flowing fast and where we get prices that are still several cents a gallon below the Eastern average.



Trade Mark.

Buy "Corona Dry"

One pound of "Corona Dry" will do the work of three pounds of Paste Arsenate and do it better

Imitated but not duplicated

But economy is not everything. Efficiency is more important. What would it mean to you to have a spray mixture of standard strength and be absolutely sure that all of one spraying or of many sprayings was absolutely the same strength? Evaporation, difficulty of perfect mixing, make this impossible with a paste arsenate. You can have a standard efficiency if you use *Corona Dry*.

Largest and most progressive growers have rendered the verdict

A large practical usage in every section of the country has proved that "Corona Dry" is unequalled in efficiency or as "easy mixing." It does not freeze, dry out or cake; always retains its original strength. A perfect mixture, a perfect standard of unvarying strength is assured with

"CORONA DRY"

Arsenate of Lead

Patented June 30, 1913

The "Standard" for Convenience, Economy, Efficiency

Quickly and easily mixed. No working up—no straining needed—no sediment. No lumps. No waste. Never clogs spray nozzle. Highest per cent. of actual killing power. Absolutely safe, will not burn. Sold in net weight packages: 200 lbs., 100 lbs., 50 lbs., 25 lbs., 5 lbs., 1 lb. No shrinkage, seepage, evaporation. Every package contains actual net weight of "Corona Dry" paid for. Remember, "Corona Dry" means no guesswork, but a standardized spray in which the mixture is always the same strength and efficiency

Write for Booklet. Ask for Corona "Tree Insurance" Policy. Address

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Portland, Ore.—Portland Seed Co.

Northwestern Sales Agents **Portland Seed Co., Portland, Oregon** **Catalogues and prices on request**

Government Aid for Fruit Growers and Selling Agents

[NOTE.—The editor had the pleasure of listening to a very instructive talk on this subject delivered to an audience of fruit growers in Hood River, who were very much interested. The editor has written up this address entirely from memory, endeavoring to the best of his ability to embrace in a short article, briefly, the important features of the address. Therefore the reader will please bear in mind that this article was not written by Mr. Moomaw, but was written from memory by the editor of "Better Fruit," who desires to express his apologies to Mr. Moomaw for any oversights or errors and also desires to apologize for his lack of ability to express Mr. Moomaw's opinions and explanations in the intelligent way and forceful language of Mr. Moomaw.]

THE uniform contract for all growers to sign with the selling concerns embraces principles which the government officials believe will be vital and powerful factors in assisting fruitgrowers of Oregon, Washington, Idaho and Montana in the future, to obtain better net results for their products. The uniform contract permits the grower to fix the price at which his fruit or product may be sold, but does not place the responsibility for loss on the selling concern for failure to secure this price.

"It shall be the duty of the agent to co-operate with all resident selling agents who are members of the Fruit Growers' Agencies, Incorporated, for the following purposes: To secure in-

formation as to crop conditions in order to determine the economic values of varieties and grades of fruits and other products." Such information is absolutely necessary for the purpose of establishing market values or selling prices. It is equally bad to start prices too high or too low; in fact, it is worse to start too high than to start too low because by so doing the demand and consumption are arrested at the beginning of the season, and consequently the consuming habit is stilled in its infancy. Prices should be such as to stimulate immediate consumption at the commencement of the season and should continue at no time so high as to prevent sales. The California Fruit Exchange spends over \$100,000 annually to secure just such information.

If the growers want "the big stick" they have it right in the contract and can use it to protect themselves without injuring the business of any fair selling agency or anyone else. The aim of this contract is to create a condition under which selling agencies can and will work in close harmony with growers with the aim of securing uniform methods in harvesting, growing, packing and the physical handling of fruit from the tree to the car, and to

secure a standardization and enforcement of the grading and inspection of fruits and products in the States of Oregon, Washington, Idaho and Montana.

Growers generally attribute low returns to the selling agencies entirely. It is a fact that during the past season and in previous years apple growers of the Northwest have allowed their apples to hang too long on the trees in order to get the fullest amount of color and for various other reasons, unnecessary and unexplainable, have allowed them to lie in the packing houses for weeks before being packed. Consequently apple shipments have arrived on the market in overripe condition, necessitating immediate sales at prices under the actual values for fruit in prime condition for fruit which has averaged around 25 cents less per box, and frequently more than could have been realized had the apples arrived in firm, keeping condition.

Fruitgrowers have continually and persistently allowed the apples to become too ripe before packing to be in fit condition to go on cold storage. Refrigerator cars will not prolong the keeping quality of apples in overripe condition. Consequently the only

THE HURST STEAM FRUIT EVAPORATOR

A Few Reasons

Why it is adapted to *Your* needs

- 1 The Hurst Evaporator is built in units of $\frac{1}{2}$ ton capacity of green fruit in 24 hours. You can add one or more units any time without stopping the operation of the first unit.
- 2 Each unit is controlled by a separate automatic temperature regulator with a range of 30 degrees from 150 to 180. Experience has taught us that this range brings the best results in evaporating.
- 3 Any style boiler may be used having a pressure of from 50 to 100 pounds.
- 4 The Hurst Evaporator is shipped **knocked-down**—saving you freight. It can be set up very easily from the plans we furnish with each shipment.
- 5 The Hurst Evaporator is built like a cabinet—screws only are used. Each unit requires floor space of 34" by 100". It stands 86" high.
- 6 Glass doors on both ends permit you to see the condition of the fruit at any time.
- 7 Italian Prunes can be evaporated in 14 hours—Apples in 2 hours—Loganberries in 12 hours.
- 8 Made in one size **only**.
- 9 Made on order only.
- 10 Each evaporator is thoroughly tested before shipment is made.

Write for prices and illustrated catalogue.

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Lime Sulphur
Bordeaux
Lead Arsenate

Oregon Arsenical Spray Co.

Formerly at Clackamas

HOOD RIVER, OREGON

course open to the selling concerns was to save refrigeration expense by shipping under ventilation and take market values for fruit in overripe condition on arrival in glutted markets. If this same fruit had arrived in prime condition under refrigeration, fit for cold storage, frequently 25 cents and sometimes more per box could have been obtained. It is possible and reasonable to assume that 10 per cent or more annually can be saved by better preparation of apples for market.

Fruit prices have been so near the level of production cost that economy in every department has become a necessity. False economy, however, is a losing business. To allow fruit to become too ripe by endeavoring to save paying out money for necessary help to pick and pack promptly, depending on your family to do the work instead of hiring sufficient help, is a losing proposition—a statement which must be admitted by all intelligent fruitgrowers.

Community packing houses are now recognized as essential for proper handling of fruits. It will cost you no more, and generally less, to pack through a community packing house than in your own packing house. If your son works on the home place, he saves you paying out \$2.00 per day; if he works in the community packing house and earns \$2.00 per day, you are even. The proposition is as broad as it long. The fruitgrower does not save any more money in having his own boy pack his fruit than he would save if he had his fruit packed by a community packing house that employs his son.

Pick your fruit quickly and rapidly when ready, and pack today or tomorrow. By so doing you will extend the life of an apple at least a month or more. Selling concerns must co-operate and work with growers to insure picking at the right time, prompt packing and immediate delivery to the cold storage plant. By so doing, an immense annual loss that has occurred in the past will be prevented in the future.

Northwest growers think they do everything in the orchard business better and more up to date than anywhere else in the world. The Mooma family have owned large orchards in Virginia since 1869, which have now been handled by members of the second generation for 29 years and, frankly, from experience, the following statement is justified. Some of your methods in the Northwest would not be tolerated in Virginia by any of the growers. Every grower in Virginia picks "today" and either packs "today" or "tomorrow."

Spitzenbergs, Winesaps, Newtowns, Rome Beauties and your other winter varieties are usually picked in October, and it is a fact that a large proportion of your growers allow these varieties to remain in the packing house for weeks before being packed out. Frequently some of them do not get these varieties packed out until way along in

December. It is not an uncommon thing to see a grower hauling a load of Spitzenbergs to the warehouse in December which were picked in October.

The Spitzenbergs and Newtowns are highly specialized in the Northwest, and particularly in Hood River. It is true these two varieties can be grown successfully in only a few localities and these are limited, but this does not justify growers in assuming that they can go on the market with these or any other varieties without due consideration for the quantity of apples and varieties which are grown in other districts. The Northwest apple growers are not so independent as they imagine. There are many problems that are common to all districts. Growers must realize this and admit it and be willing to co-operate with other districts on all problems that are common problems. Bad conditions in other districts are most serious problems with which Northwestern fruit-growers will continually have to contend. Poor or low-grade fruit and inferior varieties are the worst kind of competition. Some districts pack poor stuff, diseased and wormy. This should be stopped. Generally it sells for less than the cost of production and freight, and when it sells it prevents the sale of all good grades and good varieties at prices which would pay a living profit.

The packing and sale of poor stuff should be stopped by adopting uniform grading rules with legal enforcement. The importance and value of uniform grading, legal enforcement and inspection, has been demonstrated satisfactorily to the most doubtful as a necessary business method by the Wenatchee district, which originated and carried into practical operation in 1915 the best plan for uniform grading, legal enforcement and inspection that has ever been created or operated anywhere among fruitgrowers in the United States.

An official inspection certificate is one of the best selling cards in the world. Just one illustration, for example, will be very convincing. A Philadelphia house bought two cars of Wenatchee apples which arrived without inspection certificates, rejecting them on arrival. Inspection certificates were telegraphed for and on arrival the dealer, although the market was more depressed and values lower, on presentation of certificates, accepted the cars and paid the original purchase price.

Uniform standards, uniform systems of legal enforcement, community packing houses, quicker handling and cold storage facilities, are all vital problems necessary for the better success in the future.

Cold storage can only retard decay; it cannot prevent it. It is absolutely necessary, to secure the maximum life of an apple in cold storage, to have it go on cold storage in prime, sound condition.

Scale—Scab—Mildew

These are the principal pests and diseases affecting the apple orchard

LILLY'S Soluble Sulphur

Is the best spray for scale, mildew and scab. It has a proved record of five years. Effective, Economical, Convenient.

Note results obtained by—

Washington Station, using 20 lbs. to 100 gallons:
Yakima Valley in 1913—99% scale killed.
Yakima Valley in 1914—98% scale killed.
Wenatchee Valley in 1915—98% scale killed.

Note results obtained by—

District Inspector at North Yakima in 1914 with 20 lbs. to 100 gallons, 99% scale killed.
Again three tests at different strength in 1915:
15 lbs. to 100 gallons—75% scale killed.
20 lbs. to 100 gallons—96% scale killed.
25 lbs. to 100 gallons—98% scale killed.

This is an indisputable scientific record.

100-lb. drum.....	\$7.50
10-lb. can.....	1.25
1-lb. can.....	.20

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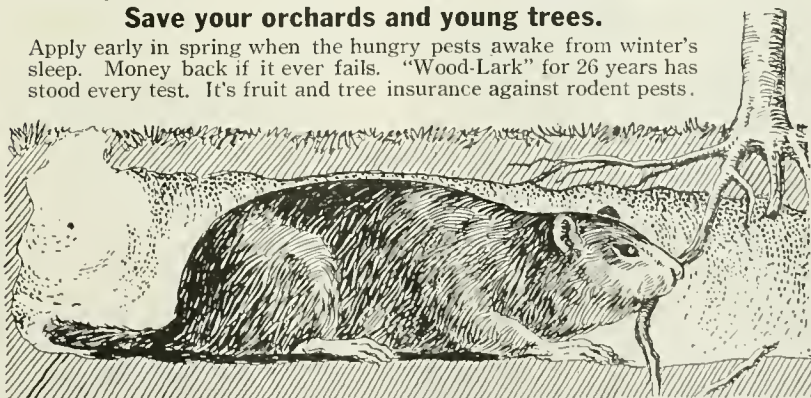
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TRADE "WOOD-LARK" MARK GOPHER & SQUIRREL POISON

QUICK, CERTAIN, DEADLY. ALWAYS READY, NEVER FAILS

Destroys Squirrels, Gophers, Diggers, Prairie Dogs, Sage Rats.
Save your orchards and young trees.

Apply early in spring when the hungry pests awake from winter's sleep. Money back if it ever fails. "Wood-Lark" for 26 years has stood every test. It's fruit and tree insurance against rodent pests.



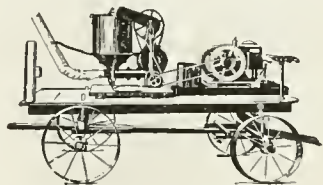
Manufactured by CLARKE-WOODWARD DRUG CO., Portland, Ore.

In the past, selling concerns have had to hustle all season for tonnage to maintain their existence, not only in advance of the market season, but at its commencement and during the entire selling period. This was a condition for which selling agencies were not entirely to blame. Fruitgrowers

thought themselves wise enough and smart enough by holding out from signing to be able to obtain later the best marketing price. They held out with the hope that some cash buyer would come along and offer a satisfactory price, or they held out until some commission man came along

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Saves 60% of Spraying Cost

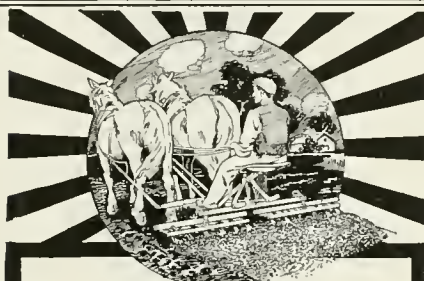


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"Fine Work!"

—that's what you'll say when you see
the soil, manure and stubble mixed over
and over with the

"Acme" Pulverizing Harrow

"The coulters do the work." They cut
and crush clods, turn the soil twice,
pulverize and mulch at one operation.
There's an "Acme" for every purpose—sizes
3 to 17-1/2 feet in width. Send for free book—
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Wenatchee Fruit and Vegetable Picking Bags

(Patented April 27, 1915)

The mouth of this bag is a novel shape, admitting the putting of the fruit or vegetables in the bag, using both hands at the same time, and bag is emptied by releasing a snap. The bag will hold about a bushel. When snapped at the frame it will hold about a half bushel. The frame is made of steel, the canvas is 10-oz. and every point is reinforced with leather where from experience it has been found necessary. This bag is acknowledged by the growers of the Wenatchee, Yakima and Hood River Valleys to be the best bag now on the market. **Price \$1.75 post paid** to all parts of the United States where we have no agents.

Wenatchee Hardware Company
Sole Manufacturers Wenatchee, Wash.

guaranteeing an advance, with good promises of splendid prices. If these did not materialize, then they signed up with a selling concern, crowding a big tonnage onto the selling concern late in the season, which was unexpected and for which no preparation had been made for efficient selling. Selling concerns must be protected against such practices if they are expected to get the best results. They must know in advance what volume of fruit they will control for market, and be prepared in advance and have time to look up markets and make the necessary connections for disposing of their product to the best possible advantage. They must not be hampered by being compelled to devote their time to securing signatures to contracts in order to acquire the necessary tonnage to pay running expenses. It is essential that economy must be observed in tonnage campaigns; growers are getting tired of paying money out of their pockets for high-priced men to solicit their tonnage; they are getting tired of buying automobiles for this purpose and paying for the gasoline which is burned up in this way.

Preparation for selling should begin in July and continue throughout August and September, and be thorough in securing a knowledge of the best opportunities and the best methods of disposing of the coming crop. All this knowledge should be available and secured in advance of the selling season.

Growers have been to blame for many disastrous conditions in the past. It has been common in many districts for growers to hold out for cash buyers; when they did not materialize at the last moment, to sign up with some selling concern and swamp it with an unexpected tonnage late in the season.

This contract will cut out this evil by requiring all growers to sign up by July first. This date will protect growers against their own follies and cut out the extra and continued expensive tonnage campaign of solicitation which the growers have paid for in the past.

The minimum number of cars required for membership as a selling concern in this agency will be 100. As a matter of fact it is more or less the opinion of the government officials that a tonnage of 500 cars is actually necessary in order to enable a selling concern to provide itself with an efficient system for handling and selling to the best advantage. However, it was decided to make the limit necessary for membership a minimum of 100 cars. The trustees will be composed of five men connected with the selling agencies, five representative fruitgrowers and one trustee to be selected by these ten.

Active membership will be \$100 per year, giving full voting power. Passive memberships will be \$5.00 per year, with all privileges except voting and office holding.

A uniform system of accounting, showing the prices for the varieties, grades and sizes, will be adopted so

Spraying Suggestions

In the control of orchard pests during the growing season it is important that all spray materials used be properly balanced chemically, manufactured for a definite purpose and of the best quality obtainable in order to give effective control of insects and diseases without injury to the trees, foliage or fruit.

ATOMIC SULPHUR PASTE, a non-caustic fungicide, is safe to use and gives effective and lasting results without injury to trees, foliage or fruit when properly applied. It can be safely combined with Orchard Brand Arsenate of Lead when spraying for codling moth control and it is important that it be first added at the time of the calyx spray in order to start the stimulation which results in increased vigor to the tree, the setting of more uniform crop of fruit and a proper control of mildew, which disease is becoming more general throughout the Northwest each year. When thoroughly applied after blooming time at proper intervals it is also effective in preventing any further growth of scab fungus and will control red spiders and mites on fruit trees. Atomic Sulphur is the best material known to control brown rot and scab on prunes, peaches, plums and similar stone fruits and for the control of mildew on all classes of fruit trees, grape vines and ornamental plants.

ORCHARD BRAND ARSENATE OF LEAD PASTE is now easy to handle and mix with water because it is so manufactured as to prevent settling in a hard mass to the bottom of containers, and is a soft, fluffy paste which, after diluting in water, maintains the best possible suspension which insures an even coating of poison, closely adhering to the surface of fruit and foliage, giving lasting and effective results. Chemical ingredients guaranteed. Those growers desiring the dry form of lead will find the Orchard Brand lead powder convenient to use and effective.

Complete stocks of both Atomic Sulphur and Arsenate of Lead, together with other necessary Orchard Brand Spray materials carried in the Northwest with the following distributors:

GILBERT & DeWITT,
Hood River, Oregon.
BALFOUR, GUTHRIE & CO.,
Portland, Oregon.
ROGUE RIVER CO-OPERATIVE FRUIT
GROWERS' ASSOCIATION,
Medford, Oregon.
MORGAN, McKAIG COMPANY,
North Yakima, Washington.
WELLS & WADE,
Wenatchee, Washington.
McGOWAN BROTHERS HARDWARE
COMPANY,
Spokane, Washington.
SAMUEL LONEY & COMPANY,
Walla Walla, Washington.
C. J. SINSEL,
Boise, Idaho.

Fruit Growers will do well to write us giving full description of pests and troubles on their orchards, and we will reply by personal letter as fully as possible.

General Chemical Company
San Francisco, California
Manufacturers of



any grower can make intelligent and correct comparisons.

An annual audit by a certified accountant of account sales will be required each year of every concern, one month in advance of the closing date for signing of contracts.

Frequent meetings of the officers of the various selling concerns, active and passive members, will enable the selling concerns to acquire a better knowledge of values and serve to maintain and stabilize prices. These conferences and exchanges of opinions will be forceful factors in preventing unnecessary price cutting or selling at ridiculously low prices.

Uniform Contract for the Growers and Selling Agents of Fruits and Produce in the Pacific Northwest.

In consideration of the mutual advantages to be derived herefrom, it is agreed between the parties to this contract as follows:

1. The grower shall have the exclusive right and authority to fix the price at which his products or any part thereof may be sold by the selling agent, but in event the price so fixed shall be higher than the best market price obtainable after offering the same, the selling agent shall in no wise be held responsible for failure to negotiate sales at such prices.

11. It shall be the duty of the agent to co-operate with all growers' resident selling agents who are members of the Fruit Growers' Agency, Incorporated, for the following purposes:

(a) To secure information as to crop conditions in order to determine the economic values of varieties and grades.

(b) To work in close harmony with growers with the aim of securing uniform methods in the harvesting, grading, packing and the physical handling of the fruit from tree to car; and to secure a standardization and enforcement of the grading and inspection rules of the States of Oregon, Washington, Idaho and Montana.

(c) To agree upon a date after which no contracts for tonnage shall be entered into.

(d) To discuss in conference market conditions and experiences with various mediums used in the markets for the purpose of ascertaining the most efficient agencies and market outlets for the economical performance of their mutual contract.

(e) To secure improvement in transportation and storage service and conditions.

(f) To work out definite plans for the development of various domestic and Canadian markets, utilizing experienced men and the combined resources of the said agents.

(g) To develop foreign markets along the following lines:

(1) To conduct comprehensive foreign investigations for the purpose of knowing trade demands and making reliable trade connections.

(2) To see that the fruit is prepared for market so that the grade and pack may be in accordance with the best trade demands.

(3) To supervise the physical handling of the shipments through to final destination and to secure adequate insurance so that the hazards may be reduced.

(4) To secure capable foreign agents to conduct sales abroad.

(5) To expand old markets and develop new ones by direct contact and through the solicitation of special agents.

(6) To devise ways and means to safeguard and secure prompt collections.

(7) To secure adequate transportation facilities by underwriting steamship charters and promoting new fruit trade routes.

(h) To pool proceeds of sales and share, pro rata, any loss sustained in the development of new markets according to the varieties and grades over definite periods, so that profits and losses therefrom may be equalized.

(i) To secure the standardization of agents' accounting records, to the extent that all account sales issued by the said shipping agencies will be figured on the same basis and in such manner that they will be uniform, allowing true comparisons to be made by the grower between the services rendered and prices secured by the different agencies.

(j) To secure an annual audit of the sales records of the current season's business of said agents by firms of certified public ac-

Millions of Worms

LAST SEASON

A Fight on Your Hands

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Established 1839 CLEVELAND, OHIO

BRANCHES

New York, St. Paul, Cincinnati, Chicago, St. Louis
 Detroit, New Orleans, Boston, Philadelphia

countants of recognized standing, the reports of these audits to be available to the growers not later than one month prior to the closing of the contract period for the next season.

(k) To make all possible legal and banking arrangements for the financing of the growers.

(l) Advancements shall in no case be made in such manner as to pass title of the fruit.

Editor Better Fruit:

I have read with considerable interest your two articles in the March number descriptive of the different forms of plant lice and methods of treatment, one by Paul R. Jones, entomologist, and one by Dr. A. L. Melander, entomologist. Mr. Jones has attained good results and recommends "Black Leaf 40" to combat these troubles, while Professor Melander says the best material found to control aphids is nicotine sulphate. No doubt, in the minds of many who have read these articles, there is now a conflict or confusion, and the instructive value of the articles is lost, in a measure, because of the fact that there are at least some who do not know that "Black Leaf 40" and sulphate of nicotine are one and the

same thing. For the sake of correctness and better understanding by all, would it not be better to refer to these spray materials by their true name, when they have one, rather than using the coined brand name of any manufacturer? A Subscriber.

A new spray is being introduced for maggots, grubs and worms, which infest the vegetable gardens, and is being put on the market under the name of "Carco Brand" by the Standard Chemical Co. of Tacoma, Washington.

Orchard Heating.—Fruitgrowers who are troubled with frosts which usually occur in April or May in the Northwestern territories, should make up their minds if they are going to do any orchard heating this year. If so, they should buy their supplies early.

The brood sow should be fed well. The following directions for a good ration are given by the Missouri Experiment Station: Corn, 50 parts by weight; shorts, 25 parts; alfalfa hay or bran, 15 parts; linseed oil meal, 10 parts.

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
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E. H. SHEPHERD, Editor and Publisher

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

What is the matter with us fruit-growers of the Northwest? In the Sacramento Valley, California, the bulk of deciduous fruit is handled by the California Fruit Distributors in a very successful way under the able management of Mr. Virden. Good prices have been obtained year after year on the average, paying the grower a good profit on the investment. The California Fruit Distributors is an incorporated concern. In Southern California the bulk of the tonnage in oranges, lemons and grapefruit is handled by the California Fruit Growers' Exchange, under the very able management of G. Harold Powell. The California Fruit Growers' Exchange has met with phenomenal success. A few years ago when the orange industry of Southern California amounted to 1400 cars per year, it was universally conceded that the industry was overdone. The California Fruit Growers' Exchange has developed and created a demand and sale for a steadily and rapidly increasing volume, totaling annually over 50,000 cars, obtaining good prices, prices that pay the grower a satisfactory profit on the investment. The California Fruit Growers' Exchange is a model co-operative institution. The raisin growers of California organized an association which has pulled this industry out of the slough of despondency. The walnut growers of California have probably the most thorough organization of any, controlling practically the entire output of that state, and are so strong that they practically dominate prices at which walnuts are sold.

Now, about the Northwest for comparison. Up and down, now and then, here and there, has been the situation for years. A few years ago the fruit-growers became dissatisfied with marketing through individuals, shipping on consignment or selling f.o.b. to cash

buyers, and started a crusade for associations. The result was in a few years over one hundred fruitgrowers' associations were formed in the Northwest. Every district had its organization and many of them were exceedingly good ones. At first they were all supported and met with excellent success, then the kicking began and members withdrew. The Northwestern Fruit Exchange was created a few years ago, with modern conveniences, systematic business methods, splendid equipment, large connections, under the management of able men. Then the North Pacific Fruit Distributors was created, a mutual co-operative organization, organized by able fruitgrowers, representing every district of the Northwest, a child of their own creation, after their own ideas, owned and controlled by themselves. But it failed to get the fruitgrowers' support and at no time did they control tonnage in excess of about 50 per cent. The fruitgrowers did not support what they had created and again were not satisfied. In 1915, the growers, after a year of dissatisfaction in 1914, organized the Fruit Growers' Council and Board of Control. Representatives and chosen delegates to the number of about 300 from every section of Oregon, Washington, Idaho and Montana met together in two meetings, which lasted several days and several nights. Everybody got what they wanted; everything was done the way the fruit growers wanted it done; they created an institution after their own ideas and were the bosses. You know the result. The Northwestern Fruit Growers' Council was never supported by the growers, and the very growers who had formed it refused to put up the small sum of one-quarter of a cent per box to finance it.

Last year the government, on the urgent request of the fruit industry of the Northwest, business men and bankers, sent government officials to the Northwest to study the fruit industry. They paid their own expenses, they asked no pay, they wanted only information. Did they get it? In 1915 there were 9400 cars of apples shipped. All the government asked was that every shipper should report the destination of the cars shipped. Less than one-half, or about 4500 cars, reported destination of tonnage. One-half of the fruitgrowers helped the government by giving information they asked for, the other half not only did not, but blocked the wheels of progress. The fruit situation in the Northwest looks similar to the condition existing in the United States at the time of the Civil War—about one-half of the United States supported the United States government, the other half did not. The United States came near going busted. They fought it out to a finish and finally all agreed in peace to support the United States government, and today the United States is the most wonderful country in the world. So it may be with us fruitgrowers of the Northwest. We may go busted. Half of us want to support organization,

government control, and orderly, intelligent marketing of the crop—the other half have never supported such a movement. Will we go busted, or can we agree on peace terms and universally support organization, government, control and orderly distribution? Government officials who have given the matter study for nearly two years, who have no axe to grind and get no pay for what they are doing, who have no other interests than to help us, state that the fruit industry of the Northwest can only be put on a proper paying basis through organization and orderly control.

The Newtown Pippin.—The Newtown Pippin is rated by the American Pomological Society at nine to ten. This rating is only exceeded by one other apple for quality, viz., the Spitzenburg, which is given a rating of ten. The Newtown Pippin originated on Long Island, New York, from where trees were obtained and the apple quite extensively planted in Virginia and along the Hudson River. Later this apple was introduced on the Pacific Coast. The number of districts where the Newtown can be grown successfully and is grown in a commercial way are comparatively few,—fewer than any other variety of apple and more limited in area. The producing districts growing a quantity of the Newtown Pippin are the Hudson River; Virginia; Pajaro Valley, California; Rogue River Valley and Hood River Valley, Oregon; Yakima and Walla Walla Valleys, Washington. While the Newtown Pippin is produced in a small way in a few other sections on the Pacific Coast it is not grown anywhere extensively except in the districts above named. The Newtown Pippin keeps in excellent condition until about April; in cold storage it keeps in excellent condition until July and August. It does not mature sufficiently to be a good eating apple until in December, but from that time on it is not surpassed for flavor, juiciness or quality by any other variety. If you will read the little article reproduced in this issue as to the origin of the Newtown Pippin it will give you a splendid idea of the popularity of this apple in Europe, more particularly in England, Scotland and Germany, where the imports exceed any other variety of apple grown on the Pacific Coast. The popularity of this apple abroad, where people have to pay a great deal more for it on account of freight, than they do for home-grown apples, should be sufficient evidence to convince any thinking individual there is every reason to assume the Newtown Pippin should be just as popular throughout the United States in the late winter months as abroad. The fact of the matter is the Newtown Pippin never has been properly distributed, or even introduced or an attempt made to introduce it of any importance in any of the consuming centers of the United States outside of the City of New York. This is excusable for the reason that in previous

years the demand for this apple abroad was so large that the growers did not have to look for home markets, as the foreign markets readily took practically all of the entire crop. A Hood River man, two or three years ago, attended the Western Fruit Jobbers' Association in Denver, composed of over 500 fruit dealers, covering the entire Middle West and Pacific Coast. At this convention he made a display of Newtown Pippins, Spitzenbergs and Ortleys. A few of the dealers recognized the Spitzenbergs, the ones who had lived in New York, where this variety is grown to some extent, but hardly a dealer knew the name of the Newtown or recognized the variety when he saw it. There was not a single individual who was familiar with the Ortley. There seems to be a popular impression that the United States wants red apples, and red apples only. While it must be admitted there is always a demand for red apples if the variety is good, but that is not sufficient reason why the public will not buy yellow varieties of apples if they are of good quality. That yellow varieties are popular where introduced must be admitted from the fact that there is an immense sale for Grimes Golden and Belleflower. In this connection it seems pertinent to call attention to the fact that Colorado is a large producer of red apples, particularly the Winesap and Jonathan, yet the City of Denver bought more Belleflowers from California than any other city of the United States outside of California. Through the advertising campaign conducted in Los Angeles and Portland in 1914 by the Hood River Apple Growers' Association the Newtown Pippin was introduced, meeting with popular favor and a ready sale, where previously no demand had existed. Therefore, in conclusion, there is good reason to believe if the right kind of effort is made in conjunction with the right kind of a publicity campaign, backed up with a strong selling force, that the Newtown Pippin can be made as popular in this country as in Europe, selling for prices that would pay the growers equally well if not better than the prices obtained when exported.

Preparedness can only be accomplished through organization. Germany has demonstrated this beyond all argument. You know the result. Do you as a fruitgrower need any further convincing to impress you with the necessity of being prepared for marketing the coming crop. If the fruitgrowers don't know that this preparation can only be done through organization then they had better carry on a little investigation.

Growers in districts that are fortunate to have a good lime and sulphur factory should patronize that factory when they want lime and sulphur. Save the freight on water. You should help home industries and help build up your community by encouraging home pay rolls, which keep money at home.

PROOF OF OUR LEADERSHIP

Elsewhere in this paper you will find factory advertisements of nationally known lines of orchard and farm implements—handled in the Northwest by us and our agents.

Myers Spray Pumps and Power Sprayers

A line we have handled for years. We carry the Largest Stock of Spray Pumps and Fittings on the Coast.

Light Draft Harrows

We assisted in the development of this wonderful harrow. Nothing Like It for Orchard Cultivation.

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We do not handle imitations. When you want a Double or Single Action Cutaway buy the Original Clark Harrow and you make a safe investment.

BIRDS OF A FEATHER FLOCK TOGETHER

Our entire line is built upon a quality basis. Get our prices on anything you need in Farm Implements and Supplies.

Mitchell
LEWIS & STAYER CO.

Portland, Ore.
and
Spokane, Wn.]

The government officials who have carried on market investigations during the past season say that no selling organization with less than 100 cars per year will be eligible to membership in the selling agencies incorporated for the reason that no selling concern with an income on less than 100 cars has sufficient funds to secure able salesmen, necessary market information and render efficient service. Although they have placed the membership in the agency incorporated at 100 cars, it is really their opinion that concerns should have a tonnage of 500 cars to render the most efficient service and best results.

Don't get scared before you are hurt. Don't count your chickens before they are hatched. Don't put out big estimates at the blossom time. You had better wait until the crop is set and then be sure before you "get too free" with your big estimates. Nothing demoralizes the fruit market more than early exaggerated estimates. The damage that is done can never be overcome.

Are you going to help yourself by adopting government methods, following the advice given by government officials, and sign up with some marketing concern affiliated with the selling agencies incorporated before July 1st, or will you buck the government and its service by staying out, again inviting 1912 and 1914 prices, and repetition of previous disasters?

Wenatchee deserves great credit for creating the only plan of uniform grading, inspection and legal enforcement ever attempted by the fruitgrowers. Be it further to their credit that Wenatchee put this plan into successful practical operation in the year 1915.

The vinegar factory, the evaporator and the cannery are the fruitgrowers' best friends. They are faithful; they never desert you, but stay with you year after year. Don't forget they will pay you more money for low-grade fruit any year than you will get for fresh fruit sold on glutted markets, that is not in prime condition for long-distance shipment.

The government officials, C. E. Bassett, W. H. Kerr and C. W. Moomaw, after a very careful investigation of the Northwestern fruit industry, covering a period of one year, state publicly that success and profit for the fruitgrower depend on shipping through organized selling agencies or associations.

Uniform grading rules, inspection and legal enforcement is the only plan that will give your packed fruit in the warehouse or cold storage or rolling an established market value or make it a security that has bankable value.

Every little city and every fruit district has from one dozen to fifty fraternal organizations. This indicates that the fruitgrower is a great joiner. He joins everything that comes along except the Association.

Uniform grading and inspection with legal enforcement is the only method that will absolutely standardize our fruit. Without standardization there can be no established trade and demand.

The worst competition is self-competition existing within each district.

It is better to start selling prices on fruit too low than too high.

Live Stock and the Orchard—Care for What We Have

I. D. Graham, Editor Rural Spirit, Portland, Before Oregon State Horticultural Society Meeting at Corvallis

EVERY human being is interested in some form of animal life, and the natural and more immediate interest of civilized man centers in the domestic animals. Moreover, the welfare of the human race has always and everywhere been largely dependent upon our animal friends and neighbors. The wild man of the forest and plain is no more dependent for his welfare upon the animal life within his reach than is the up-to-date horticulturist, who represents the highest type of civilization. It is because of the lack of a full realization of this fact and of its importance that serious mistakes have been made in our work of developing our country, and of preserving its rich heritage for future generations as well as for our own declining years. That's what's the matter with Oregon today.

Ever since it has been my privilege to reside in Oregon I have been hearing, on all hands, that the great and immediate need of this state is more people—a large population to aid in the development of our boundless resources. If this state only had more people all would be well and prosperity would take up her permanent abode in the territory lying between California and Washington. This is all wrong. What Oregon needs is to take care of the people she already has. When these become unduly prosperous plenty of others will come and they will not need to be urged. The first

thing to do, the first step toward a larger population, is to get rid of our present reputation. Sounds strange, doesn't it. But that is exactly what I mean. All over this broad land and wherever the State of Oregon is known her reputation rests almost entirely upon only two of the creative industries—fish and fruit—and we must get away from this.

Now don't misunderstand me. Don't get away from the fishing and don't get away from the fruit, but do get away from the reputation that these are the only things that Oregon can or does produce. Get away from the reputation that this is a one-crop state, but don't harm a single tree or bush or vine. No one is more proud of the fact that Oregon is one of the greatest fruit-producing states in the world than I am. No one is more proud of the quality of the fruit we produce, and there is nothing better that grows, but I do feel chagrin that the world does not know that we produce other things as well. Such a reputation is harmful rather than beneficial and settlers are not tempted to a state with a one-crop reputation only. We must get away from it and this can be done only by working together. First, we must co-operate with associations and individuals. Co-operation and not competition is the real foundation of modern success. The great business interests of today, the widespread of our public utilities, even the inroads which

we make against vice and ignorance are the results of community efforts. Real and permanent success can come only by working together—each doing his part for the general good and each understanding the viewpoint and needs of the other fellow. Second, raise more fruit, with live stock. In the production of fruit this state has not even approached the possibilities. Living as we do upon the rim of the world, where the wilderness has made its last stand and where we occupy the last land, with our population increasing by leaps and bounds, there is no more promising field of industry, no greater inducement for a successful career and no safer or more remunerative vocation in any field of human endeavor than can be found upon the American farm. More fruit can be raised by planting more ground, of course, but the land is all taken and many of us do not have the help or the equipment with which to handle more land, if we had it. There remains but one thing—get more out of the land we have, and this can be done in only one way. Make of live stock an important factor in all orchard and farming operations.

Rotation of crops, green manures and artificial fertilizers are all helps to immediate results, but they are but temporary makeshifts at best. The alternating of a deep-rooted crop with one of shallow growth serves to increase present yields, but will ultimately exhaust both layers of soil. The plowing under of green manures is an excellent practice, but serves barely to prevent a marked decrease in soil fertility, while the use of most chemical fertilizers produces a temporary stimulation and not a real fertilization of the soil, and is at best but an expensive substitute for barnyard manure.

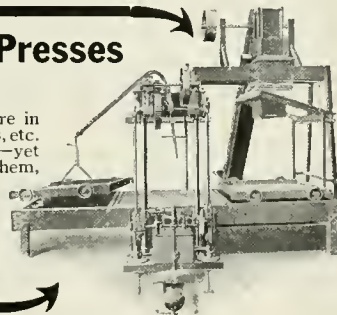
In addition to maintaining the fertility of the soil in nature's own way, which is most important, live stock is a money-maker of no mean quality on its own account, and it has this pre-eminent advantage: It enables you to make money all the year round and not during the crop season only. Without live stock your plant must lie idle many months of the year; with it you work the plant on full time. Live stock furnishes a pleasant employment. I think most men, and I am sure most boys, enjoy working with animals, and I am equally positive that if there is any solution to the question of why the boy leaves the farm it is most often answered favorably by live stock—when the boy owns it. The products of live stock are always in demand and at more stable prices than any other farm product, and this demand will increase as population increases, while the beginner in orcharding—the man who is starting his orchard to growing and who has a cow, a hen and a sow, does not need to worry about something to eat while he waits for his

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FOR forty years they have assisted apple growers everywhere in wiping out the apple waste from windfalls, culls, undergrades, etc. These cost just as much to grow as the highest grade of apples—yet they are unmarketable. However, there is no need of losing them, because they may be made into **Good Marketable Cider**.

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PACIFIC COAST REPRESENTATIVES
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Standard Oil Company
(California)

MICA AXLE GREASE

trees to grow. Live-stock manufactures the coarser and cruder farm products into highly valuable and readily salable commodities, and in doing this it utilizes much that would otherwise be waste.

There is a vast deal of waste on the American farm—so much that we are astonished when we really find it out. It is said that the average foreigner who is familiar with farming conditions in Europe is amazed at the vast waste of really valuable material which he finds on the American farm. This waste of the farm is a very real one and may prove to be the one factor which decides between profit and loss. If the farmer, by his present methods, is losing money or is barely holding his own, as too many of them are, then a change of method is necessary and this change does not need to be in the production of larger yields, but in the saving of waste and the stopping of leaks, in order to make money. If this waste can be saved and the leaks stopped in addition to the production of larger yields, then the problem is more nearly solved and the future has fewer apprehensions. Saving is just as important as earning.

The culled fruits from the orchard when supplemented with alfalfa, clover or peas, some of which may be grown in the orchard itself, makes a very palatable and satisfactory maintenance ration. I know of one man who was a consistent prize winner at the big live-stock shows this fall who raises and feeds his hogs on cull apples and alfalfa, supplemented with a small grain ration while fitting. This man only owns ten acres, and that is all in orchard. I know another man who accomplishes a like result with another breed of hogs on a three-acre orchard. These men are successful. They have good fruit and they win prizes with their hogs. They succeed with their fruit because they have the hogs, and they succeed with their hogs, in part at least, because they have a waste material on their farms which is utilized by their hogs. But it is in the keeping up of the fertility of the soil that live stock has its greatest value to either orchardist or farmer. There never can be any permanent system of agriculture without live stock. The depletion of our soils through constant cultivation without feeding them is the gravest danger to American agriculture, and when our agriculture fails our nation fails.

The cash value of barnyard manure is \$27.74 per year for each 1000 pounds weight of horse. That from cows is \$29.27 for each 1000 pounds of live animal. That from hogs is \$37.96; from calves \$24.45 and from sheep \$26.09 for each 1000 pounds of live weight. These figures represent the actual fertilizing value, but give no credit for the benefits in the mechanical condition of the soil which are derived from the use of barnyard manure. These figures also represent profits which the orchardist who does not keep live stock might have but does not get.



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Northwest



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Two Million
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the welfare of individual or business is seldom endangered where industry and sound financial guidance are in co-operation. This long-established, strong state bank desires to indicate its willingness to place its business friendship at the disposal of those who require, and can estimate, the service it is so well prepared to render.

Ladd & Tilton Bank, Portland, Oregon

Statement of the Ownership, Management, Circulation, Etc.

Required by the Act of Congress of August 24, 1912.

of "Better Fruit," Published Monthly at Hood River, Oregon, for April, 1916.

State of Oregon, }
County of Hood River, } ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared E. H. Shepard, who having been duly sworn according to law, deposes and says that he is the editor and business manager of "Better Fruit," and that the following is to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher, Better Fruit Publishing Company, Postoffice address, Hood River, Oregon.
Editor, E. H. Shepard, Postoffice address, Hood River, Oregon.
Managing Editor, E. H. Shepard, Postoffice address, Hood River, Oregon.
Business Manager, E. H. Shepard, Postoffice address, Hood River, Oregon.

2. That the owners are: (Give names and addresses of individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding one per cent or more of the total amount of stock.)

Better Fruit Publishing Company, E. H. Shepard, Hood River, Oregon.

3. That the known bondholders, mortgagees and other security holders owning or holding one per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

(Signed)

E. H. SHEPARD,
Editor and Business Manager.

Sworn to and subscribed before me this 29th day of March, 1916.
(Seal)

ALTON W. ON'THANK.

Notary Public for the State of Oregon.
(My Commission expires May 29, 1919.)

These figures represent profit over and above that which may be made on the live stock itself, so that if the orchardist only "breaks even" on the live stock he is still ahead of the game.

The farm is a factory which, in order to be profitable, must be worked to its highest efficiency. This can never be attained through any single-crop system like fruit or grain growing. Nor through any system which is wasteful of materials or which allows the plant to lie idle for long periods. Nor yet through any system which requires a large amount of hired labor to meet emergencies like the harvest and then ceases its activities. Live stock corrects all these evils and is the only thing that will. Live stock keeps the farm working every month in the year:

it utilizes waste materials and manufactures them into the highest-priced farm products, for which there is always a demand. It restores and maintains the fertility of the soil without which other crops cannot be produced. It brings a steady income which is less subject to fluctuations in a period of years through weather and market conditions. It adds to the joy of life by affording animate things to work with and bring a profit while the other crops are growing, and it affords the only insurance of continuous success on the farm.

The snowfall in Hood River Valley during the winter of 1915-16 was 119¾ inches. That means plenty of moisture in the ground, which means a good crop this year.

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Rosette and Cover Crops

By O. T. Clawson, Inspector at Large, Wenatchee, Washington

ROSETTE has caused a great loss to the orchardist of this as well as other districts of the Northwest, and a great deal of experimenting has been the result. Many of these experiments have given partial results or even perfect results under certain conditions. In some cases dynamiting has given good returns. The applying of nitrate of soda, manuring, liming, subsoiling, pruning and many other cures have been used with varying success, but the one cure which is given almost universal credence is the planting of a leguminous cover crop, preferably alfalfa. While arguing for alfalfa in the orchard early last year I made the statement that "I could take anyone to at least a hundred orchards in the main valley where alfalfa had been grown for three years or more and that if anyone could show me rosette in any one of the orchards, I should turn him my monthly check." More or less publicity was made of this statement with the result that three supposed exceptions were cited me.

The first case was that of a ten-acre piece in East Wenatchee which had been in alfalfa previous to settling the orchard, which was then five years old. About three-quarters of the place had been kept almost free from alfalfa and throughout this portion the rosette was rife. Many of the trees were so badly affected that the owner was seriously considering pulling them out entirely. Probably three-quarters of the trees showed rosette. On the other quarter the alfalfa had been permitted to volunteer and formed a fairly good stand. In this quarter of the tract one tree showed slight signs of rosette. The nearest bunch of alfalfa to this tree measured eight feet from the base and the second nearest fifteen. The second

exception cited was at Cashmere. Upon investigation it was found that the alfalfa had been in only two seasons. According to the statement of the owner the trees had been so badly rosetted that he had seriously considered pulling them out. During the two past years, following the seeding to alfalfa the condition of the trees had improved three hundred per cent and he believed that if they continued to improve another year as they had for the last two, the third year would find them entirely free from rosette. The third place was at Wenatchee, where there was rosette in an orchard which had been seeded to alfalfa for four years. There was no rosette whatever in the alfalfa, but it was abundant in a portion of the orchard not in alfalfa.

My statement was a rash one, but it was made after carefully following the results secured by the many ranchers of North-Central Washington who are using alfalfa as a cover crop. In this district there are 7,687 acres of orchard in which alfalfa is used as a cover crop. Clover and vetch are used with more or less satisfaction also, but the popularity of the alfalfa is illustrated by the fact that there are 458.5 acres of clover and 470 acres of vetch used, as compared to the 7687 acres of alfalfa. Very small plantings of peas, rye and sweet clover are also to be found. A cover crop is rarely used in an orchard before the trees reach the age of five years, but where it is planted earlier than that it is put in strips with six or seven-foot cultivation strips next to the tree rows; with the idea of seeding the cultivation strips when the trees are old enough to stand the close proximity of the alfalfa. In the few orchards where the alfalfa has been

put in too early the results have been discouraging.

It is generally considered that alfalfa causes a heavy drain upon the moisture supply during the first two years after seeding. After the roots have become deeply established and the tops are large enough to shade the ground, little if any more water is required than in clean cultivation. In fact, many places seem to indicate an actual saving of moisture. What would seem to be the ideal method of handling the crop is the constant disking in of the alfalfa tops, furrowing and irrigating until a blanket of vegetable mulch from the decaying alfalfa tops covers the entire surface of the ground. But few of the Wenatchee Valley ranchers use this method. Some cut one crop of hay, disc immediately after cutting, irrigate and then follow the first method for the remainder of the year. This gives excellent results. The greater number practice the cutting of two or three crops for hay and disking thoroughly in the spring to work in the late growth. In several orchards the alfalfa has been left unmolested to grow up and fall down; undisseeded, uncultivated and unfurrowed. One noted ex-

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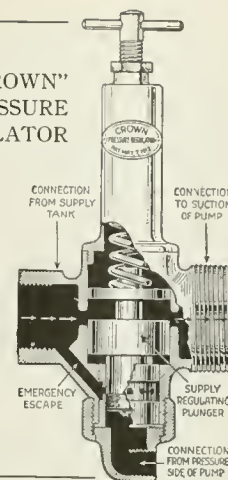


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ample of this method is the Barney and Williams tract, which is often cited as the model of alfalfa results. In the latter method the alfalfa grows thickly enough to choke out the weeds and the expense of handling is reduced to a minimum.

Where the water supply is short the alfalfa may be planted in drill rows with cultivation strips between in order to get it established without seriously reducing the moisture supply. This method has been practiced in certain parts of the district with fairly satisfactory results and is recommended where it is desirable to get alfalfa established over extensive areas with poor watering facilities. Generally small or alternate strips are sowed solidly to alfalfa where the water supply is not sufficient to sow all at once. In any case where an orchard is affected with rosette I believe the one demonstrated sure-cure should be used. It may require that the alfalfa be put in drill rows or even drill row, but within three years following the seeding the rancher may be practically certain that his trees will not be bothered with rosette if the alfalfa is close and thick enough to penetrate to sufficient extent the rooting area of the trees.

Southern Pacific Issues Book on Walnut Culture in Western Oregon

The Southern Pacific has recently issued a handsomely illustrated book, "Oregon Walnuts." The text was written by Mr. C. I. Lewis, Chief, Division of Horticulture, Oregon Agricultural College, Corvallis, Oregon. The cover

plate shows a collection of Oregon walnuts in natural colors. The interior pictures are taken from various walnut orchards throughout Western Oregon, and show, in addition to general views, technical illustrations of grafting, pruning, budding, etc.

Professor Lewis has covered the walnut industry very thoroughly in this book, and it should be in the hands of every walnut grower in this state. He treats first of the consumption of walnuts in the United States, and calls attention to the fact that there were imported into the United States last year over thirty million pounds of walnuts. Although Oregon produces but a small proportion of the walnuts grown in this country, nevertheless

over one-fourth of the young non-bearing walnut trees of the United States are right here in Oregon. Throughout the book are chapters on the following very interesting subjects: Choosing the Orchard, Sprouting the Seed, Grafting, Establishing the Orchard, Setting the Trees, Pruning, Diseases, Insects, Varieties of Walnuts. Copies of this book can be obtained from Southern Pacific agents, or by addressing Mr. John M. Scott, General Passenger Agent, Southern Pacific Company, Portland, Oregon.

Yellow apples are often better quality than red. If you don't think so, eat a Yellow Newtown Pippin and then try to eat a Ben Davis.

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(INTERNATIONAL RAILWAY JOURNAL)
Philadelphia — February, 1916



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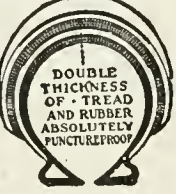
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Marketing and Farm Credits

A new note is sounded in the book "Marketing and Farm Credits" for 1915, just off the press. The book contains the addresses given at the third annual sessions of the National Conference on Marketing and Farm Credits in joint program with the National Council of Farmers' Co-operative Associations. It contains 544 pages, is printed on good paper in clear type and is brimful of interesting facts about the two great business problems that farmers must solve for themselves, that every person on a farm or interested in farming should know. The price of the book is one dollar (postage 15 cents extra). Write Secretary Charles W. Holman, Washington Building, Madison, Wisconsin, for further information. (Adv.)

Fighting the Rose Aphis.—Rose growers who allow the flowers to be damaged by the ravages of the rose aphis, have only themselves to blame, according to the U. S. Department of Agriculture. Although the aphis is widespread over the entire country, as well as abroad, it is easily controlled. Careful spraying of the plants with solutions of nicotine will remove all danger and neither the expense nor the trouble involved is sufficiently great to be a real obstacle. The rose aphis is a small insect with a body about one-twelfth of an inch long. The young and some adult forms are wingless, but certain adults develop wings from time to time. The color varies from green to pink. By means of its slender beak the aphis sucks out the juices of the plant on whose buds and unfolding leaves it feeds. These, prevented from attaining their perfect form, become curled and distorted and the beauty of the flowers is in large measure ruined. Moreover, the aphis secretes a sweet sticky liquid called honeydew, which spoils the appearance of the foliage on which it is deposited. Under favorable conditions it propagates rapidly throughout the year. For example, some recent investigations conducted in California by the Department of Agriculture showed that one female gave birth to 48 young in six days. At the end of that time, the mother aphis was knocked from the rose and perished. This is not at all an uncommon fate. A heavy rain, which washes the insect away, is one of its most natural checks, though birds and other insects prey upon the aphis to a considerable extent. Extreme heat is also unfavorable to the aphis. The rose lover should not, however, depend upon nature to rid his garden of the pest. A 40-per-cent solution of nicotine is much surer and not much more trouble. One part of the solution to from 1,000 to 2,000 parts of water, with the addition of one pound of whale-oil soap to every 50 gallons of the mixture, is recommended in Bulletin 90, "The Rose Aphis," which the U. S. Department of Agriculture has just issued. A more convenient recipe, when there are only a few bushes to be treated, is a teaspoonful of 10-per-cent nicotine solution to two gallons of water and one-half ounce of whale-oil soap. The soap should be shaved fine and dissolved in hot water. Mixtures of this character should be applied as a fine, penetrating spray by means of a compressed-air sprayer or bucket pump. Such a pump costs from \$3.50 to \$15.00. Together with nicotine solutions it can usually be obtained at seed stores. If no pump is to be had, however, the infested twigs should be dipped in a pail of the solution. Care should be taken to use these solutions at strengths no greater than those mentioned above, since injury to the foliage may result through the use of too much soap, or mildew be favored by too strong a nicotine solution. Application of insecticides should be made on the first appearance of the pest, which varies from the time that the leaves are put forth until the buds begin to form. Applications should be repeated as found necessary.

Spring Manuring.—Now is the time to spread manure. The quicker the better, so that it can be plowed in with the early cultivation, giving it a chance to rot, which will not only enrich the soil but increase the humus, which helps make plant food more available.



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The Yakima Horticultural Union has voted to set aside one cent per box for the purpose of creating a fund with which to build a cold storage plant. It is estimated that the plant will cost about \$20,000 and will have the capacity for 100 carloads. In early summer the plant will be used for cherries, peaches and pears.

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E. J. Chubbuck Company are putting out a very attractive poster which is making quite a hit with the trade, illustrating their Ideal gopher trap. The color work is beautifully done, the panel being made from a photograph taken by a California farmer who has secured splendid results in destroying pocket gophers with the use of these traps.

Routledge Seed and Floral Co. have recently issued a very attractive seed catalog for 1916 containing some interesting and valuable information in reference to gardening, in addition to the lists of varieties, prices, etc. The same can be obtained by addressing Routledge Seed and Floral Co., 169 Second Street, Portland, Oregon.

Dwarf Apples.—The Experiment Station of Geneva, New York, after ten years' experience with Dwarf Apples, state that they are not considered commercially promising. Considerable information is given in connection with experiments regarding Dwarf Apples in Bulletin 106, issued by the Geneva Experiment Station.

Inspector De Sellem of Yakima is one of the very active inspectors who means what he says. He has already sent out notices advising fruitgrowers that the laws for spraying will be enforced during the coming season. If every inspector did as good work as De Sellem fruitgrowers would have fewer pests and diseases, secure cleaner crops and make more money.

Wenatchee fruitgrowers held a meeting in the Commercial Club rooms during February, object being to cut out consignment. A committee was appointed for the purpose of convincing the growers with the view of pledging them to sell for cash during the year 1916. It was stated that a special invitation will be given to dealers who are cash buyers to come to Wenatchee this year.

The British government, on account of the heavy expense incurred by the war, has up for consideration an embargo on all imports otherwise than actual necessities. Apples are included in the program.



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Our new Souvenir Calendar is now ready, containing photographic views of our New York and Chicago offices, extracts from the "BLUE BOOK" Trading Rules, Fruit and Produce Grades, Law of Commerce, Historical Review of the Organization and other information of practical every day value to shippers. It will be sent free to any shipper who handles five cars or more in a season, who will fill in and mail following coupon.

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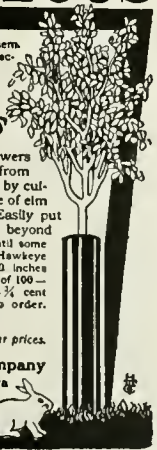
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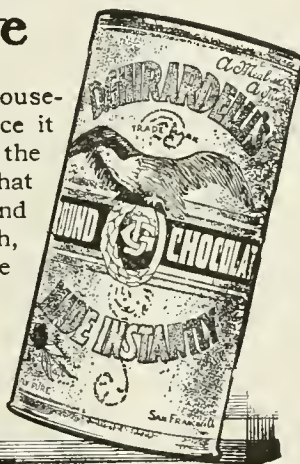
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ject to several diseases and insects, control of which can be accomplished by spraying immediately with lime-sulphur solution. These are peach-leaf curl, San Jose scale and the peach worm. In Hood River the more severe of these troubles is the leaf curl, and in most localities the spray is almost necessary for the production of a good crop. Lime-sulphur applied at this time will prove of some benefit in controlling California peach blight, a disease which produces a gummy exudation on the twigs, ultimately killing them. For the complete control of this disease it is necessary to spray both in the fall before the rainy season sets in and again in the spring before the buds burst.

The best all-round application for peach at this time of the year is lime-sulphur, as it acts not only as an insecticide, destroying the scale and hibernating peach worm, but also a very effective fungicide. The material should be used at winter strength, that is, 1 to 10 of water. Bordeaux 6-6-50 will satisfactorily control the leaf curl, but will not be effective in destroying the scale or the peach worm. When spraying the peaches do not overlook the other deciduous trees, cherries, plums, apricots, etc., for they are all very agreeable food plants of San Jose scale and if neglected will serve as very effective breeding centers for further infestations.

Control of Pests of Pear.—Of the several insect pests of the pear there are only three or four that can be satisfactorily controlled by spraying at this time of the year. These are the pear-

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Pests that Demand Immediate Control

By LeRoy Childs, Hood River Experiment Station

THERE are several insect pests and plant diseases of our different orchard crops that can only be satisfactorily controlled by spraying before the foliage starts. The following suggestions are offered in controlling the more important pests of different fruit trees by early spraying:

Successful spraying depends upon taking advantage of the critical period in the life history of insect pest or plant disease almost entirely, and if the opportunity afforded is not taken advantage of during this usually very limited critical period, efforts made too early or too late are largely wasted. Spontaneous appearances of extremely damaging insect pests and plant diseases are usually quite rare. For the

most part the trouble increases from year to year, ultimately resulting in severe losses unless precautionary measures are undertaken. During these periods of increase the grower should familiarize himself with the troubles that should be expected the following year and put into practice the observations that he has made. Many factors, such as altitude, temperature and weather conditions make sweeping recommendations for the timing of sprays impossible, and the development or retarding of plant or insect growth is largely dependent upon these factors. Growers should know their individual variances and put them into practice.

Control of Pests of Peach.—The peach orchards in the valley are sub-

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The most practical, healthful, playtime garments ever invented for children 1 to 8 years of age. Made in one piece with drop back. Easily slipped on or off. Easily washed. No tight elastic bands to stop circulation. Made in blue denim, and blue and white hickory stripes for all the year round. Also lighter weight, fast-color material in dark blue, cadet blue, tan or dark red for summer wear, all appropriately trimmed with fast-color galatea. Made in Dutch neck with elbow sleeves and high neck and loog sleeves.

75c the suit

If your dealer cannot supply you, we will send them, charges prepaid on receipt of price, 75c each.

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leaf blister mite, the cottony-maple scale, the San Jose scale and oyster-shell scale. The blister mite is not a true insect. It is related to the spiders, is very minute, and can be readily controlled by proper spraying. The mite attacks both fruit and foliage, malforming both. During the early summer infested leaves show puffy, patch-like spots on the under and upper surfaces which later in the season turn reddish-brown. The injury to fruit is of much the same order, destroying its marketability.

The period during which control measures can be satisfactorily applied is very limited. The mites over-winter underneath the bud scales in great numbers and are therefore out of reach of sprays if applied too early. As soon as the leaves start they immediately burrow into the leaf tissues and are soon again protected from a contact with spray. In view of these facts it is necessary to watch the growth of the trees very critically and make the applications as soon as most of the buds have bursted, but before the leaves unfold. On account of the great range in elevation in the valley and the resulting differences in time at which trees come into foliage it will be impossible to give a definite recommendation as to the exact time to make the application. Growers should use their own judgment in this matter and thoroughly spray the trees with a good pressure. Use lime-sulphur 1-10, at which strength the San Jose and oyster-shell scale will be destroyed.

The cottony-maple scale is of very limited distribution in the valley and will usually be found attacking the Winted Nelis variety. For control use miscible oil 8 gallons to 100 gallons of water. This should be applied while the trees are dormant.

Control of Insect Pests of Apple.—There are several insect pests of the apple which demand attention this month. These are the leaf-roller, woolly aphis, San Jose scale and the oyster-shell scale. The scale insects are not generally distributed in all of the orchards in the valley and applications are recommended only in orchards where they are troublesome. The four insects mentioned must all be controlled during the dormant season, as material applied after the foliage is out cannot be used strong enough to kill the insects without seriously burning foliage and developing fruit.

For the leaf-roller and the woolly aphis miscible oils will be found to give the greatest degree of satisfaction. All orchardists in the Pine Grove section are urged to use oil this spring to destroy the egg masses of the leaf-roller. A thorough spraying for this insect will incidentally destroy all of the woolly aphis that are hit. In controlling the leaf-roller spraying is directed toward the destruction of the egg masses which will be found in brownish, pad-like patches on trunk, limbs and even the smaller twigs of not only apple but pear, cherry, plum and peach. In view of the fact that



Good harness deserves good care; keep the trimmings clean and bright with

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Chases Dirt



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"On High"

Red Crown

the Gasoline of Quality

puts the "hop" into your car, gives you the quick "get-away", and the "pick-up" on the hills. It's because Red Crown is the unmixed, refinery gas, with extra power in every drop. At dealers everywhere and at our SERVICE STATIONS.

Standard Oil Company
(California)



RHODES DOUBLE CUT PRUNING SHEAR

Pat'd June 2, 1903.

RHODES MFG. CO.,
580 S. DIVISION AVE., GRAND RAPIDS, MICH.

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.

Oregon Nursery Company

ORENCO, OREGON

Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens, Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN FRANQUETTE walnut, recognized as the best walnut. Our large complete stock consists of varieties suitable for every kind of climate. Write us about your wants before buying.

Stop Wasting Time and Money

The PRESTO Duplicator

will make 10 to 100 copies of handwriting or typewriting in about two minutes.

You can use it in a hundred different ways—for duplicating price lists, circular letters, notices, shipping tags, etc.

It is extremely easy to operate—no wax stencil sheets—no printing ink—no setting of type.

Fruit Growers' Associations and Shipping Concerns will find the Beck Duplicator a splendid investment, enabling them to supply the fruit growers with necessary information by circular letters from time to time, in the best possible reading form, at the least expense.

Complete Outfit \$15

Sent on ten days trial to responsible concerns.

The A. Beck Duplicator Co.
Rm. 1761, 476 Broadway
New York City

FRUIT GROWERS Dehydrate Your By-Products

It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the best By-Product machine ever devised. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

The manufacturers of this Dehydrator have recently patented new and improved automatic labor-saving preparatory machinery which will further reduce the present low cost for the production of this product.

For new descriptive booklet address

LUTHER MANUFACTURING CO.
San Francisco, California

The Paris Fair

HOOD RIVER'S LARGEST
AND BEST STORE

RETAILERS OF

EVERYTHING TO WEAR

AGENTS FOR

HAMILTON & BROWN AND
THE BROWN SHOES
HART, SCHAFFNER & MARX
CLOTHES
MANHATTAN SHIRTS
JOHN B. STETSON HATS
NEMO CORSETS

Strictly Cash—One Price to All

insects deposit eggs on most all of our orchard trees, it will be well to spray all of the deciduous trees that an effective clean-up be obtained. Pruning away the long out-of-the-way branches will greatly aid in making a thorough application of the oil. The following formula is suggested for leaf-roller control:

Miscible oil, 6 gallons; water, 100 gallons.

If scale are in the orchard increase the oil to eight gallons. The oil does not have to be used as strong in controlling the woolly aphids. At this time of the year the young insects will be found in hibernation. In order to successfully pass the winter they secrete themselves in protected places under the rough bark of trunk and limbs and in old scars, so that in making the application extreme care must be exercised that all parts of the trees be covered. When applying the spray hold the nozzle close to the trunks and with a good pressure force the oil up under the old bark scales. Cover all limbs and branches as well. Use the following formula for woolly-aphis control:

Miscible oil, 4 gallons; whale-oil soap, 2 pounds; water, 100 gallons.

This is not strong enough to destroy the eggs of the leaf-roller or scale insects. If these are present use the preceding formula.

The San Jose scale and the oyster-shell scale can be controlled by using either winter strength lime-sulphur or strong emulsion of the miscible oil. As the oil can answer a dual or triple purpose in insect control, its use appears more advisable than the less expensive lime-sulphur, which will only destroy the scale insects. The following formulas are suggested for scale-insect control:

Lime-sulphur (32 degree), 10 gallons; water, 100 gallons; or, Miscible oil, 8 gallons; water, 100 gallons.

Beekeeping and Fruit Growing

By Oscar Kazmeier, Kiel, Wisconsin.

NATURE having intended these two lines of work for their mutual benefit together, in fact what two lines will harmonize so well together as these two, and yet in years past and even today in some sections there is a strong antagonism between the beekeeper and fruitgrowers. It is a fact only too well known that the cross-fertilization of the fruit trees is beneficial to the fruitgrower, insuring a good setting of his fruit, while the nectar gathered by the bees will be beneficial to the beekeeper.

Experiments conducted by the various experiment stations have invariably found the bees to be a great agent in cross-fertilization of fruit trees, clovers, etc., and are recommending fruitgrowers to see that bees are in or near their orchards, or, better still, to have beeyard in connection to your fruit farm, and thereby realizing the benefits and profits from either side. A while ago the writer had the opportunity in overhearing a conversation

25 Per Cent Reduction

ON ALL Apple, Pear, Peach, Prune, Plum, Cherry, Apricot, Nut, Shade and Ornamental Trees, Berry Bearing Plants, Flowering Shrubs, Vines, Hedge Plants, Roses, etc., etc.

We Need Room in Our Nurseries for Spring Planting

All Stock Clean, Healthy and Thrifty. Grown on virgin soil, two years from sage brush.

Most Complete Stock in the Northwest from which to select.

All Stock True to Name

Send today for Special Price List and Descriptive Catalog

O. & F. Nursery Co.
Box 217 K
Wapato, Wash.

PORTLAND WHOLESALE NURSERY COMPANY
Rooms 6 & 7, 122½ Grand Ave., Portland, Oregon

Wholesalers of Nursery Stock and Nursery Supplies
A very complete line of
Fruit and Ornamental Trees, Shrubs, Vines, Etc.

SPECIALTIES

Clean Coast Grown Seedlings
Oregon Champion Gooseberries and
Perfection Currants
Write Now

Frost Damage Prevented

BOLTON ORCHARD HEATERS

29c each

Two-Gallon Capacity

Send for booklet

The Frost Prevention Co.

Merchants National Bank Bldg.
San Francisco, Cal.

Northwest Fence & Supply Co.



MANUFACTURED BY
All kinds of ladders,
orchard supplies,
Bastian Pruners, lawn
fence and gates
372 574 EAST OAK STREET
CORVALLIS, OREGON
GET OUR PRICES PHONE 5377

between a few horticulturists who were discussing the value of bees in an orchard, one of them claiming he had been taking the best care of his orchard in years past, but never had been able to get a good crop from it until he placed some stands of bees in his orchard and was more than surprised at the bumper crops he got. It has been the writer's own observation that orchards situated close to apiaries had set a much larger per cent of fruit than those a few miles away from them. In the cross-fertilization of strawberries, cucumbers, etc., where the wind cannot aid in carrying the pollen from blossom to blossom, it is here where the insects must perform the work, especially the bees.

The harmful effects of bees in an orchard are few, if any. They are blamed for the puncturing of fruits, especially grapes, but through close observations it will be noticed that they only attack fruit already injured; they are also to some extent blamed for the spreading of the pear blight in a pear orchard, but according to Professor H. A. Surface of the Agricultural Department of Harrisburg, Pennsylvania, the pear blight often spreads without the invasion of bees. Furthermore, these are not the only sole agents of spreading the germs and should therefore not be condemned by the pear grower.

The greatest loss to the beekeeper is the spraying during fruit bloom, while all experiment stations are now recommending to spray when about three-quarters of the petals have fallen, for it has been found that any solution that is strong enough to kill the codling moth during full bloom, will also be harmful to the delicate reproductive organs of the flower. It is known that the nectar gathered from fruit bloom is generally only valuable to the beekeeper for coming so early in the season it stimulates the colony for brood rearing, thereby building it up into strong, rousing colonies, which are so essential in producing a big surplus from the basswood, clovers, buckwheat, etc.; and here again they are beneficial in the cross-fertilization of these plants. Hence it goes to prove that the horticulturist farmers and beekeepers must unite for their mutual benefit, for any advantage it offers to the bee redounds to the mutual good of all three.

Officers of Montana State Horticultural Society for 1916: President, M. L. Dean, Missoula; first vice president, F. B. Linfield, Bozeman; second vice president, W. B. George, Billings; third vice president, Mrs. A. C. Herbst, Libby; fourth vice president, Professor D. B. Swingle, Bozeman; fifth vice president, Mrs. Ben Kress, Hamilton; secretary-treasurer, Professor O. B. Whipple, Bozeman; trustees, C. C. Willis, I. D. O'Donnell, J. C. Wood, A. V. Platt, Mrs. Ben Kress, W. J. Crismas.

Fertilizers are recommended for vegetable gardens. Professor Boquet advises the use of stable manure and wood ashes, which can be used to good advantage for all crops except potatoes. There are many brands of commercial fertilizers on the market which are big factors in increasing the yields of vegetables. Nitrate is always very desirable in truck gardening.

Planet Jr. Hand Cultivators

The garden tools for big results

They are saving time, lightening labor, and producing better crops for over two million farmers and gardeners. Planet Jr tools last a life-time. Fully guaranteed. **72-page Catalog, free!**

Describes over 70 tools including 12 entirely new ones, and improvements to our Seeders, Wheel-Hoes, Horse Hoes, Harrows, and Corn, Potato, Orchard, and Beet Riding-Cultivators. Write for it today!

S L Allen & Co Box 1106U Philadelphia

No. 4 Planet Jr Combined Hill and Drill Seeder, Wheel-Hoe, Cultivator and Plow pays for itself in a single season in the family garden as well as in larger acreage. Sows all garden seeds (in drills or hills), plows, opens furrows and covers them, hoes and cultivates easily and thoroughly all through the season.

No. 11 Planet Jr Combined Double and Single Wheel-Hoe, Cultivator, Plow and Rake. Straddles crops till 20 inches high, then works between. The plows open furrows and cover them. The cultivator teeth work deep or shallow. The hoes are wonderful weed-killers. The rakes do fine cultivation and gather up trash. Unbreakable steel frame. Strong high steel wheels and specially hardened steels—new this year. The greatest hand-cultivating tool in the world.



Don't Pot Your Trees

Spade-dug holes, like pots, confine and cramp the roots. Set your trees out in blasted holes. Stop the big percentage of early losses. Make them grow sturdy, hearty and fast. Cash in on your investment quicker by getting earlier yields.



Drawn from actual photo.—Note marked difference in growth between tree planted in blasted hole and tree planted in spade-dug hole.

Practical Proofs

E. J. BARKER, Beech Bluff, Tenn., says: "I would not set trees without first subsoiling with explosives, even if it cost four times the amount."

J. C. SAYLOR, Penna., says: "Blasted trees the finest in the orchard."

O. C. LANGFIELD, Calif., says: "Planted 14,000 trees with dynamite—advanced value of land from \$15 to \$200 per acre in less than a year."



Red Cross Farm Powder

lightens labor and increases profits. It loosens the earth, makes better rootage and provides increased nourishment for young trees. It rejuvenates old trees and makes them bear.

GET THIS BIG BOOK FREE

Describes the use of Red Cross Farm Powder for tree planting, land clearing, subsoiling, ditching and many other things. Tells what this modern method has done for hundreds of orchardists and farmers. Write to-day for this interesting 188-page

Handbook of Explosives No. 338-F

E. I. du Pont de Nemours & Co.
Wilmington, Delaware

PORTLAND, OREGON

Portland Hotel

The hotel which made Portland, Oregon, famous
Most Desirably Located. In the Center of Shopping and Theatre District
Covers a City Block.

Broadway, Sixth, Morrison and Yamhill Streets
European Plan—\$1.00 per day and upward;

Write for Portland Hotel Booklet.

GEO. C. OBER, Manager

Dow Arsenate of Lead

and where quality and price are the deciding factors. For the fourth consecutive season we have had the business of the State Forester of Massachusetts, which alone represents a tonnage of close to one and a half million pounds. This is a contract awarded only to the parties able to make the best quality and price consistent with that quality. From the standpoint of quality and price we offer you in Dow Arsenate of Lead the best that you can procure.

Our tremendous increase in business from year to year among the fruit growers of the United States and also foreign countries is the best evidence we can offer you that Dow Lead does better work. We can supply you from five different distributing centers in the Northwest. If you are not in touch with any one of them write us.

The Dow Chemical Company

MIDLAND, MICHIGAN

Statement of Distribution N. W. Box Apples

By Chas. J. Brand, Chief Markets and Rural Organization U. S. Department of Agriculture

THE following statement of the distribution of apple shipments from the four Northwestern states, Washington, Oregon, Idaho and Montana, made at the request of the shippers and growers, is based on the voluntary reports of the shippers and the railroads.

From the waybills furnished by the railroad station agents it was ascertained that 461 shippers, large and small, participated in the distribution of the apple crop. This number includes growers' organizations, local cash-buying firms, local representatives of Eastern wholesale houses, local mercantile houses, local brokers, traveling brokers and growers. Among the grow-

ers were those who had large commercial orchards and those who could ship only one car.

The total number of cars reported by the railroads represents the actual number of cars shipped out of the territory, as taken from the best source of information available.

The total number of cars reported by shippers is the number of cars upon which information has been received from the shippers reporting cars which have actually been delivered at the destinations indicated.

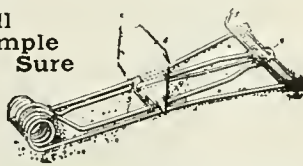
The incompleteness of the information is due to the fact that a great many of the shippers and organizations have not received their returns and that data cannot be included in this review until received by this office. At the end of the shipping season, when more complete data are available, it may be possible to issue another statement.

Column A indicates the number of cars of apples reported by the railroads as moving to the destinations shown below. Column B shows the number reported by the shippers.

Illinois	A	B
Chicago	791	251
Rockford	5	0
Miscellaneous	4	3
Indiana		
Indianapolis	2	3
Miscellaneous	1	1
Iowa		
Burlington	4	0
Cedar Rapids	2	3
Davenport	3	4
Des Moines	21	29
Mason City	3	2
Sioux City	31	14
Waterloo	6	4
Miscellaneous	20	7
Kansas		
Dodge City	3	1
Independence	2	4
Salina	2	4
Wichita	7	7
Miscellaneous	10	8

Macabee Gopher Trap

Small
Simple
Sure



At all dealers. If your dealer does not handle it, send **20 Cents in Stamps** and mention your dealer's name and get sample by mail, postage paid. Write for prices in larger quantities delivered free by parcel post.

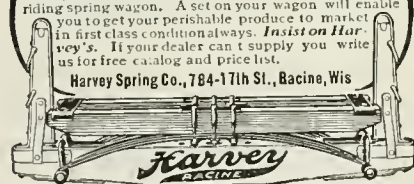
Z. A. MACABEE

Box P Los Gatos, California

Rides Like An Auto

The New Patented Harvey Bolster Springs are made just like the finest automobile springs. They absorb all the bumps, jars and jerks of rough, uneven roads, and change an ordinary wagon into an easy-riding spring wagon. A set on your wagon will enable you to get your perishable produce to market in first class condition always. **Insist on Harvey's.** If your dealer can't supply you write us for free catalog and price list.

Harvey Spring Co., 784-17th St., Racine, Wis.



YOU CAN EARN \$50.00 PER DAY with the Gearless Improved Standard Well Drilling Machine. Drills through any formation. Five years ahead of any other. Has record of drilling 150 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2 1/2 gallons distillate at 9c per gallon. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W-8. **REIERSON MACHINERY CO., Mfgs., 1295-97 Hood St., Portland, Ore.**

TREESAVIN

Treesavin protects your trees against all crawling insects, worms and ants, but does not hinder respiration of the tree "skin" as do sticky resinous mixtures when painted on. Treesavin lasts a whole season. Indispensable for preventing "bleeding" from cuts and wounds. Easily removed and replaced. While it does better work than any other sticky tree protector, Treesavin is cheaper to use and takes one-tenth the time to apply. Made in rolls 4 in. wide, 18 yds. long sufficient to cover 9 trees 12 in. diameter. If your dealer can't supply you, order direct. **Write for catalog and descriptive matter.** Per box, 50 cents; three boxes, \$1.40; six boxes, \$3.00; twelve boxes, \$5.00. **Berg & Beard Mfg. Co., 12-14 Steuben St., Brooklyn, N. Y.**

FREE SAMPLE OREGON GROWN SEED OATS

100 TO 125 BU PER ACRE
NORTH PACIFIC LAND SHOWS 1913-14
FIRST PRIZE OREGON STATE FAIR
EVERY YEAR SINCE 1902
\$700.00 IN PRIZES
BIG EXPOSITIONS FROM ONE EXHIBIT
ONE SEASON
PRICES:
4 LBS. \$1 PREPAID
100 LBS. \$4 F.O.B. PORTLAND

1916 CATALOG of Diamond Quality Tested Seeds is a reliable and safe guide to your purchases and a reference book every grower should have. Ask for Catalog No. 200

FOR YOUR SAMPLE WRITE TO
PORTLAND SEED COMPANY
PORTLAND, OREGON

PORTLAND SEED COMPANY
Diamond Quality
THREE MARK

Kentucky	A	B
Lexington	1	1
Louisville	8	7
Louisiana		
Jennings	0	1
Lake Charles	1	1
New Orleans	51	73
Shreveport	11	19
Maine		
Bangor	3	2
Portland	1	5
Miscellaneous	1	1
Maryland		
Baltimore	51	42
Massachusetts		
Boston	257	182
Brookton	1	1
Springfield	2	2
Worcester	2	2
Michigan		
Detroit	22	17
Grand Rapids	1	0
Miscellaneous	4	2
Minnesota		
Crookston	17	17
Duluth	101	36
Minneapolis	332	91
St. Paul	127	28
Miscellaneous	59	31
Missouri		
Joplin	2	4
Kansas City	81	77
St. Louis	17	10
Miscellaneous	1	0
Montana		
Anaconda	15	10
Baker	5	5
Billings	40	21
Bozeman	9	7
Butte	137	51
Chinook	4	2
Cut Bank	55	2
Deer Lodge	5	3
Dillon	7	3
Glasgow	31	14
Glendive	17	5
Great Falls	86	38
Harlowtown	5	1
Havre	13	7
Helena	31	16
Lewistown	28	7
Livingston	7	6
Miles City	20	11
Missoula	17	2
Outlook	5	2
Roundup	13	8
Shelby	6	1
Sidney	1	2
Sweetgrass	1	2
Whitefish	27	0
Malta	1	1
Miscellaneous	110	61
Nebraska		
Alliance	4	0
Crawford	6	3
Grand Island	13	10
Lincoln	32	36
North Platte	203	9
Omaha	166	31
Miscellaneous	9	7
New Hampshire		
Manchester	1	1
New Jersey		
Jersey City	13	0
New York		
Buffalo	15	12
Elmira	144	92
LeRoy	35	18
New York	102	611
Rochester	6	0
Suspension Bridge	249	12
Miscellaneous	1	2
North Dakota		
Beach	19	3
Bismarck	89	55
Bowman	1	3
Crosby	5	4
Devils Lake	5	2
Dickinson	15	4
Drake	6	6
Fargo	57	33
Grand Forks	40	71
Jamestown	22	17
Langdon	4	1
Leeds	10	0
Mandan	9	1
Vinot	261	34
Portal	1	4
Ray	1	0
Bugby	25	13
Valley City	5	5
Wahpeton	32	28
Williston	57	26
Miscellaneous	153	54
Ohio		
Cincinnati	7	10
Cleveland	35	11
Toledo	2	4
Miscellaneous	2	2
Oklahoma		
Enid	37	5
McAlester	5	8
Muskogee	7	7
Tulsa	8	14
Oklahoma City	36	26
Miscellaneous	18	28



IT PAYS TO SPRAY MYERS WAY

Take care of your fruit trees—They are a wonderful source of profit—Every tree in your yard or orchard should pay dividends in perfect fruit through protection by spraying MYERS WAY.

MYERS SPRAY PUMPS

Bucket, Barrel and Power, and Nozzles and Accessories are all proven and cover every spraying need—A Pioneer Line of Standard Pumps—guaranteed for effective spraying, and equally serviceable for whitewashing, disinfecting, sprinkling, fighting fires, etc.

Our Spray Catalog—just off the press—shows complete line, and gives late Spray Calendar with instructions how and when to spray. Your copy is waiting—write today for it and ask for name of our dealer.

F. E. MYERS & BRO. 120 Orange St. ASHLAND, OHIO
PUMPS—HAY TOOLS—DOOR-HANGERS



Where Good Tillage Pays

Work close with the California Orchard Plow

The yield and quality of your fruit depend largely upon the tillage your orchard receives. Choice fruits command high prices. You can't work among the trees and under the branches with ordinary tools. It will pay you big to learn about the

Cutaway (CLARK)

California Orchard Plow

Reversible—turns the soil either to or from the trees. Extends under branches. Also made with additional extension, when desired, for unusually wide low trees. The Cutaway (Clark) California Orchard Plow balances right—there is no side-draft. Convertible into a field plow for general farm use. Has Cutaway (Clark) cutlery steel disks, forged sharp. It will improve your fruit-crop. One of the many Cutaway (Clark) tools. If not at your dealer's write direct. Write for our free book, "The Soil and Its Tillage."

The Cutaway Harrow Co.

Maker of the original CLARK disk harrows and plows

4013 Main Street
Higganum, Conn.



Save Time. Write for Catalogs

MITCHELL, LEWIS & STAVAR CO.

PORTLAND, ORE. — SPOKANE, WASH.

The Success of a Fruit Grower

depends largely on the way he cares for his orchard. Unless it is well cultivated he can not hope for good results.

For this work there is nothing that will equal

The Kimball Cultivator

in keeping the ground in perfect condition at a small cost.



The price is in reach of the small grower and can be bought from your local dealer or from

W. A. JOHNSTON, Manufacturer
THE DALLES, OREGON



Two minutes saves each tree

Use Tree Tanglefoot

on Shade and Orchard Trees against Gypsy, Brown-tail and Tussock Caterpillars, Canker Worms, Climbing Cut Worms and Ants. It is equally effective against any crawling insects.

Band Trees About Two Weeks Before Insects Appear to Get Best Results

Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application stays sticky 3 months and longer—outlasting 10 to 20 times any other substance. Remains effective rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing, simply open can and use. Will not injure trees.

For Tree Surgery

Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will water-proof the crotch of a tree, or a cavity, or wound in a tree, when nothing else will do it.

Sold by All First-Class Dealers

1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50, and 25-lb. wooden pails \$6.75. Write today for illustrated booklet on Leaf-eating Insects. Mailed free. (55)

THE O. & W. THUM COMPANY
13S Straight Ave., Grand Rapids, Mich.
Manufacturers of
Tanglefoot Fly Paper and Tree Tanglefoot

Washington	A	B
Aberdeen	10	1
Everett	30	2
Seattle	438	42
Spokane	228	63
Tacoma	39	5
Miscellaneous	43	3
Wisconsin		
Milwaukee	51	17
Miscellaneous	5	3
Wyoming		
Cheyenne	91	5
Diamondville	1	1
Laramie	12	1
Rock Springs	6	3
Sheridan	11	14
Miscellaneous	37	18
District of Columbia		
Washington	20	16
Alaska	0	2
Alberta, Canada	147	48
British Columbia	147	46
Manitoba	45	36
Australia	34	33
Saskatchewan	199	63
Ontario	15	17
Quebec	5	9
Hawaii	1	1
Totals	9407	4313

Of the above total 254 cars were exported to Europe from Boston, New York, Philadelphia and Baltimore, as reported by the railroads. One car was also reported with its destination in South America, and two cars for South Africa.

In the tabulations for Montana and North Dakota the totals designated "Miscellaneous" represent seventy-one and ninety-six destinations, respectively, to which less than four cars each were billed.

The total of column B represents the number of cars upon which reports were received both from the shippers and the railroads. The total of column A includes that of column B.

"BLUE RIBBON"

(EXTRA FANCY)

"RED RIBBON"

(FANCY)

Quality Brands of Yakima Apples

When ordering apples specify Blue Ribbon Brand and be assured of the best the market affords. All apples packed under our personal supervision and inspection.

WRITE FOR INFORMATION
AND PRICES

Yakima County Horticultural Union

FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON

Oregon	A	B	Texas	A	B
Portland	80	8	Amarillo	23	6
Miscellaneous	11	3	Beaumont	25	17
Pennsylvania			Cornus Christi	6	2
Philadelphia	71	27	Dallas	63	33
Pittsburg	73	86	El Paso	13	9
Miscellaneous	2	1	Fort Worth	96	72
Rhode Island			Galveston	4	11
Providence	9	11	Houston	52	40
South Dakota			San Antonio	20	28
Aberdeen	47	33	Texarkana	1	3
Deadwood	19	15	Waco	25	26
Huron	3	1	Miscellaneous	98	74
Mitchell	7	10	Utah		
Rapid City	1	1	Ogden	5	0
Sioux Falls	17	3	Salt Lake City	14	16
Miscellaneous	28	13	Miscellaneous	2	0
Tennessee			Virginia		
Memphis	10	8	Norfolk	2	2
Nashville	51	12	West Virginia		
Miscellaneous	3	1	Charleston	3	3
			Miscellaneous	1	1

WESTROBAC

(Soil Bacteria)

Awarded Gold Medal at the
Panama-Pacific Exposition

Will increase your crops and maintain your soil fertility. Thru a cover crop will produce more humus and nitrogen than you can otherwise get, thus insuring larger and better fruit at the small expense of **\$2.00 per can** f.o.b. laboratory, sufficient for one acre.

Garden Size Packages

To those who have small plantings—less than one acre—we can now supply Bacteria in containers large enough for an area of one-fourth acre.

These are put up for Lawns and Gardens only in the following varieties:

Sweet Peas Garden Beans
Garden Peas Clover for Lawns

Price per tube, mailed to any part of the United States

Fifty Cents

Let us tell you—write for literature (without cost)

Chas. L. Mastick Co.

74 Front St., Portland, Ore.

Northwestern Representatives
WESTERN SOIL BACTERIA CO.

The Newtown Pippin

Sydney F. Brown in Country Gentleman, Feb. 1, 1916

HOW many apple growers are acquainted with the romantic history of the Newtown Pippin? The existence of this variety alone was directly responsible for the establishment of our great export trade to Great Britain, a business that has been developed within the last hundred years by such tremendous strides that we now mention it in terms of millions of barrels annually.

About two centuries ago a seedling apple tree sprang up on the edge of a swamp in the neighborhood of the village of Newtown, Long Island. From what variety of apple that seed came we cannot tell. This seedling was allowed to grow, unmolested, ignored, as such trees are, until one day a stranger passing by saw and tasted some of the fruit from this tree. He found the flavor better than anything he had ever tasted.

After this discovery the fame of the new apple spread, and scions were taken from the parent tree to found new orchards up and down the coast. The great Hudson River Valley orchards were the children of this tree.

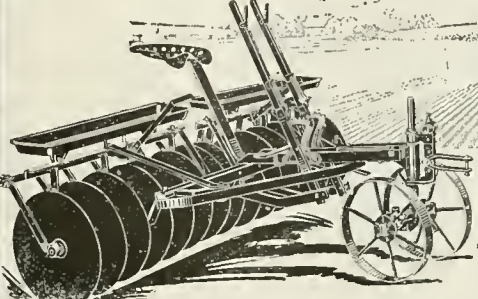
So much of the origin of the Newtown. Next comes its introduction into England.

In 1758 a box of Newtown Pippins was sent to Benjamin Franklin, our representative in England. He gave some to his friend, the distinguished English botanist and natural philosopher, Peter Collinson, who then brought scions into England. The trees had but meager success in English orchards, but the pippins from America were immensely popular in the markets of London and other English cities.

Though to Franklin must be given the honor of introducing American apples to the English people, the export trade was really inaugurated through the efforts of Andrew Stevenson, of Albemarle County, Virginia, who was minister to the Court of St. James in the first year of Queen Victoria's reign. While in England he had pippins sent from home for his own use, and he presented several barrels to the queen, who was so much pleased with the excellent quality and flavor of the apples that she rewarded Stevenson's courtesy by having the small import duty on apples removed.

Since then the pippin has become steadily more and more popular in the English markets, selling for large sums during the middle of the last century. A specific instance may be of interest at this time, when fruit growers have to be contented with three or four dollars a barrel for excellent apples.

Robert Pell, of Ulster County, New York, owned in 1845 an orchard containing a large number of Newtown Pippin trees. They yielded that year a crop which sold in the London market for as high as twenty-one dollars a barrel! The English nobility bought these apples for their tables at the startling price of one guinea a dozen—forty-two cents apiece!



For Growing Bigger Crops

International Harvester Tillage Implements

WON HIGHEST AWARD
PANAMA-PACIFIC INTERNATIONAL EXPOSITION
SAN FRANCISCO 1915
QUALITY OF AMERICAN

THE better your seed beds the more money you make from the same acreage. The best seed beds are made with **International Harvester** disk harrows, spring-tooth harrows, and peg-tooth harrows. Our tillage catalogues explain fully, but read here a few reasons why these machines give the best field service:

Disk harrows have adjustable snubbing blocks for making the gangs level, and bowed set-lever bars to keep them level when the angle of the gangs is changed. The bearings are especially designed to avoid all unnecessary friction, and make the harrows that much easier for the horses to pull.

Spring-tooth harrows have frames that slide on the ground and keep the cutting depth uniform. They can be used in sod, as well as in wet or stony land, which they are specially made to till.

The all-steel **peg-tooth harrows** are made up of stiff sections, that give the lumps strong action and leave the surface smooth.

These features, and many others that are money makers for farmers, are explained fully in our tillage catalogues, which we send promptly on request. Write for one, and read it over, before you go to the local dealer to see the implement you are interested in. The catalogue helps you to buy right.

International Harvester Company of America

(INCORPORATED)

Crawford, Neb. Denver, Col. Helena, Mont. Portland, Ore.
San Francisco, Cal. Spokane, Wash. Salt Lake City, Utah

Arcadia Irrigated Orchards

THE LARGEST AND MOST SUCCESSFUL ORCHARD PROJECT
IN THE ENTIRE WEST

7,000 acres planted to winter apples. Gravity irrigation. Located 22 miles north of Spokane, Washington, directly on the railroad. We plant and give four years' care to every orchard tract sold. \$125, first payment, secures 5 acres; \$250, first payment, secures 10 acres; balance monthly.

SEND FOR BOOKLET

Arcadia Orchards Company

Deer Park, Washington

Fire Blight Destroys Thousands of Trees

FIRE BLIGHT OF THE APPLE IS SPREAD BY APHIS

APHIS CHECKS GROWTH OF TREES
APHIS CAUSES LEAVES TO CURL
APHIS DEFORMS FRUIT
DESTROY APHIS WITH
"BLACK LEAF 40"

Guaranteed 40% Nicotine

Your dealer will furnish you this effective insecticide in concentrated form—200 gallons of spray from the 2-lb. can costs \$2.50—1,000 gallons from the 10-lb. can costs \$10.75. If he will not supply you we will send it to you, express prepaid, upon receipt of price. Write for Free Bulletins to the address below.



"BLACK LEAF 40"

40% Nicotine

The KENTUCKY TOBACCO PRODUCT CO.
INCORPORATED
LOUISVILLE, KENTUCKY.

For Quick Reply,

Routledge
SEED & FLORAL CO.
169-171 2nd St. PORTLAND ORE.

Descriptive Catalogs, Portland prices, etc., write to us. We have the stock, and can save you time and money on freight.

Our Complete Catalog No. 39 Free

F. W. BALTES AND COMPANY

Printers · Binders



Unexcelled facilities for the production of Catalogues, Booklets, Stationery, Posters and Advertising Matter. Write us for prices and specifications. Out-of-town orders executed promptly and accurately. We print BETTER FRUIT.

CORNER FIRST AND OAK STREETS
PORTLAND, OREGON

This is but a brief account of the spectacular history of the original Newtown Pippin. The old tree stood, almost within the memory of those still living, on the edge of the swamp near the Long Island village after which it was named. It lived a most useful life and achieved greatness, for men from near and far came to take scions from this famous tree, once an unnoticed seedling, which died for the cause, being literally cut to pieces by scion seekers.

Tomato Blight A Serious Menace to Tomato Industry

By F. D. Heald, Professor Plant Pathology, Washington State College, and Plant Pathologist of the Washington Experiment Station.

Continued from last issue

Rhizoctonia is a cosmopolitan fungus of omnivorous habits. As a damping-off fungus of various crop plants, it is known from all parts of the world. It has been reported by various investigators as parasitic upon the following: Peas, beans, clover, alfalfa and other leguminous crops; potato, tomato and egg plant; beets, carrots, celery, lettuce, radish, blackberry; cotton and okra; ornamental asparagus, china aster, carnation, sweet william, violet, verbena, hydrangea, candytuft, sage, phlox, begonia, coleus and snapdragon; lambs quarters, tumble weed and pig weed. It is important to note that Rhizoctonia has not been known to attack any cereals or other species of the grass family.

The Rhizoctonia disease has been found in Washington during the past season in severe form upon tomatoes, potatoes, beans, peas, cucumbers, peppers and strawberries. As a tomato and a potato trouble it has a state-wide distribution. Many bean failures in the Snake and Columbia Valleys are undoubtedly due to this disease. The symptomatology of the disease on the various hosts differs somewhat, but the causal organism can always be found upon the root system of the affected plants. The establishment of the fact that the "tomato blight" is due to Rhizoctonia, the same fungus which produces a very similar disease upon potatoes and many other plants, marks a most important advance in our knowledge. It seems probable that potatoes have been responsible for the introduction and spread of this disease more than any other crop, since tubers from an infected crop may carry the fungus.

For tomatoes there are only two possible sources of the fungus: First, a general presence of Rhizoctonia in the soil, due to the previous occurrence of the disease, either upon tomatoes or some other crop; second, the use of an infected soil for the seed bed in which the tomato plants are grown.

Suggestions for the Control of Rhizoctonia of Tomatoes

Since the fungus is confined in the main to the roots and basal portion of the stem any treatment with fungicides would be useless. The behavior of

Rhizoctonia on the various hosts suggests nothing of promise along the line of selection of varieties for resistance. While some varietal differences have been noted, the outlook is not hopeful, and it is not probable that highly resistant or immune varieties can be obtained by either breeding or selection. Cultural practices then must be resorted to in the control of this disease, and the following tentative suggestions are presented:

1. Use clean soil free from Rhizoctonia for the growth of tomato plants if they are to be transplanted, or if the soil is infected use some method of sterilization.

2. Avoid ground upon which potatoes have been grown during the past four or five years. Give attention to the possible occurrence of the disease on some other crop that might have infected the soil. Cereals and other grasses are never attacked by Rhizoctonia.

3. Practice a culture method that will supply the growing plants with an abundance of moisture. Lack of moisture increases the severity of the disease, since the fungus is constantly cutting down the supply of absorbing roots, and so making it more difficult for the plant to get sufficient water. Good cultivation for the aeration of the soil is also an important factor.

4. Use a liberal amount of fertilizer so as to stimulate the growth of the plants, and if the soil is known to be acid, correct this acidity by the application of lime. Rhizoctonia grows better in an acid soil than in those which are neutral or alkaline.

5. In transplanting to the field do not set the plants too shallow. Deep setting gives a greater opportunity for the development of adventitious fibrous roots to take the place of those killed by the fungus. It may even be advisable to set the plants in shallow trenches and gradually fill around them with successive cultivations.

6. Growing the plants in the field to avoid transplanting is sometimes of value. Injury to the root system in transplanting does not allow the entrance of the fungus, but retards the development of the young plant, without affecting the advance of the fungus. Carefully transplanted plants that suffer little or no check in their growth are more likely to keep ahead of the fungus.

7. In case a soil infection of a field is suspected, early fall plowing with frequent cultivation is suggested. It seems probable that the aeration of the soil by frequent cultivation lessens the amount of the fungus that will remain alive. Some growers have used this practice with excellent results.

Careful attention to as many of the suggestions for control as possible will very materially lessen the severity of the disease. In fact, experienced growers are learning that the tomato blight can be controlled, or at least reduced to a negligible factor.



Good Bye! Mr Gopher

—and it's so easy! No bothersome traps—no uncertainty. Simply locate the tunnel, place in it a waste ball saturated with Kilmol. In 3 minutes ignite and cover up the opening with dirt. The deadly gases quickly reach every part of the burrow and it's good-bye, Mr. Gopher!

KILMOL

SQUIRLGOPHENE

Will Kill 'Em All

Kilmol both asphyxiates and poisons—fresh air can't revive Mr. Gopher. The gas is heavier than air and so remains in the burrow for hours. Results guaranteed or money refunded. Used by Government, State and County officials with U. S. Destructor.

The waste balls we sell are better and cheaper than home-made. Ask us about new Government formula of poisoned barley. Write for interesting information on the eradication of squirrels, gophers, etc.

OREGON DISTRIBUTOR

Portland Seed Company

Dept. L

Portland

WASHINGTON DISTRIBUTOR

James & Hanes

Dept. L

Spokane



U. S. Destructor,
invented by
U. S. officials.
Forces gases in-
to burrow.

Fruit Trees get their life from the soil

They depend on the soil for sustenance. Proper nourishment reflects in the quantity and quality of the yield and **spells profit** for you if your trees are healthy and well matured.

Sustenance, such as fruit trees demand, comes from soils that contain a good supply of Potash and Phosphoric Acid, particularly the latter. Increase the **quantity and quality** of your fruit—feed your trees

BEAVER BRAND ANIMAL FERTILIZER

"A Fertilizer for Every Soil"

A fertilizer of **proven** value made for Northwest soils by the pioneer fertilizer manufacturers of the Northwest. Rich in the constituent elements that revive strength—enable the next crop to feed upon the sustenance necessary for a good yield.

Today order this
famous fertilizer and
address Box 101 for
free information
folder



UNION MEAT COMPANY

NORTH PORTLAND
OREGON.



Elwood Fence

A perfect hinge joint is formed at every second cable, making an elastic, long-life fence yet sufficiently rigid to prevent sagging. Made of tough, springy steel with a thick coat of galvanizing that adds to appearance and resists weather.

American Steel Fence Posts—cheaper than wood and more durable. Last a lifetime. *Sent Free*—write for booklet on how to set posts and erect fence. Every farmer should have it.



AWARDED



DEALERS EVERYWHERE

AMERICAN STEEL & WIRE COMPANY
CHICAGO NEW YORK PITTSBURGH CLEVELAND DENVER
Pacific Coast Rep.: **U. S. STEEL PRODUCTS CO.**
SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE

HOOD RIVER VALLEY NURSERY COMPANY

Phone 5634

Route No. 3, Box 227

HOOD RIVER, OREGON

Plantation four miles southwest of station, Belmont Road.

We will be pleased to show you trees, apple trees that have a heritage, a quality that should be considered by everyone who plants a tree. Our trees are grown in clean hillside virgin red shot soil with clay subsoil, producing the most vigorous root system. Our buds are selected from the best bearing healthy Hood River trees that make the Hood River apple famous throughout the world. Our trees will give you satisfactory results in vigor, fruit and quality. Ask for catalog. We guarantee our products. Apples, pears, peaches, apricots, almonds and walnuts. A complete line of the best varieties of all kinds of fruits.

H. S. BUTTERFIELD, President

W. J. ENSCHEDE, Manager

ASK IT—

And insist on your ticket reading

NORTHERN PACIFIC RY.

THE YELLOWSTONE PARK LINE

via Portland, or Tacoma, or Seattle, or Spokane

TAKES YOU EAST

or brings you west, in elegant trains. Entire service pleasing.
Dining service par-excellent.

East Bound

Summer Excursions, effective from June 1st.



To California, have tickets read S. S. "Northern Pacific," palatial, fast (only 26 hours at sea), leaving Portland 9 A.M., April 1, 6, 11, 15, 20, 25, 29, and regularly thereafter.

Call on any agent, or write
A. D. CHARLTON, A. G. P. A.,
Portland, Oregon

Ask about **HOMESSEEKER FARES** to Montana.

Kind of Spray Nozzle to Use

It takes a definite amount of material to spray a tree properly, whether applied as a mist or as a spray or whether applied by high or by low pressure. Therefore, to be economical in application a nozzle should not be wasteful of time, effort or material. The spray must be applied quickly, for the labor cost often amounts to more than the cost of the material used. The spray tank is an expensive storage place for the liquid. Orchard nozzles vary in capacity from a quart to three gallons per minute, yet are often used without regard to size, even though it is self-evident that it costs twice as much to spray with a gallon-a-minute nozzle as with a two-gallon nozzle. Hence from the standpoint of labor-cost as large a nozzle or as many nozzles should be used as the pump is capable of maintaining.

Secondly, the effective range of a nozzle should be as great as possible. If one nozzle spends its force four feet away and another reaches through eight feet it takes twice as much effort to spray with the former as with the latter. Mist spray nozzles have a short range, for the resistance of the air quickly checks the momentum of their fine particles. It is pertinent to ask why high pressure should be demanded in a pump if a nozzle is selected which checks the pressure. The idea of a "penetration mist" is fallacious.

Thirdly, the nozzle must not be wasteful of material. This factor often makes a good talking point until carefully scrutinized. Some nozzles throw a hollow cone of mist; others project a flat sheet of coarse spray. The latter are popularly regarded as the more wasteful of material, which assumption is based on their greater output. When they are used leisurely there is, of course, a waste of liquid, but the spray rod can be so manipulated as to utilize every drop of spray. The idea that a tree "peppered" with mist is better protected than one washed with spray is not founded on fact. Much of the liquid from a mist nozzle blows away without reaching the insect and is wasted, while the hollow cone, hitting around the mark, misses the aim as well as the purpose of the spraying.

Much of the confusion regarding nozzles has resulted from not appreciating the difference in the duties they are to perform. A nozzle intended to give a thin, uniform surface coating over foliage or bark might not answer in driving the spray into the bottom of the calyx cups, into the innermost crevices of rough bark, or behind swollen buds, or in penetrating aphid-curved leaves, or in shooting aside overhanging leaves or fruit to reach the concealments of insects and place the spray in necessary contact with their greasy bodies. To stand up under the hard test of final efficiency a nozzle must have penetrative force. Any kind of nozzle can reach the easy places; but to assure 100 per cent efficiency calls for a Clipper or Bordeaux type of nozzle.—Washington State Experiment Station Bulletin.

PRINCE ALBERT

the national joy smoke

**makes you
want to fire
up your old
jimmy pipe!**

Copyright
1918 by
R. J.
Reynolds
Tobacco
Co.

PRINCE ALBERT tobacco throws open the gates to every man fond of a pipe or a makin's cigarette—it's so *friendly!* Just makes smoke joy possible for all degrees of tender tongues and tastes, for the patented process by which Prince Albert is made cuts out bite and parch! And you can't get better proof than the fact that Prince Albert is today smoked not only throughout the United States, *but all over the world!*



On the reverse side of this tidy red tin you will read: "Process Patented July 30th, 1907," which has made three men smoke pipes where one smoked before!

First thing you do next, locate that old jimmy pipe or the makin's papers; invest 5c or 10c for a supply of P. A. And fall to like you are on the right track. For Prince Albert is better than the kindest word we ever have said about it. And you'll find that's a fact!

You can buy Prince Albert everywhere in the toppy red bag, 5c; or the tidy red tin, 10c; in pound or half-pound tin humidors or in the handsome crystal-glass pound humidor with sponge-moistener top that keeps P. A. fit-as-a-thoroughbred!

R. J. REYNOLDS TOBACCO CO., Winston-Salem, N. C.

RE-ORDERS

Every business man knows that the stability of his business is measured by re-orders.

If customers do not come back, something is wrong.

But if the most careful buyers in the field, having tried the goods, find them satisfactory and come back for more, the business is sound.

Advertising may be judged by the same sure test.



In 1915 The Saturday Evening Post carried the equivalent of 1682 full pages of advertising—1,143,502 lines.

Of this, 1429 pages, or 971,991 lines, came from firms which had also advertised in the Post the year before.

These figures mean that:

The Saturday Evening Post drew 85% of its volume in 1915 from the same customers that had bought its space in 1914.

That is, the re-orders of Post advertising amounted to 85%.

This evidence of the stability of modern advertising is not new. A year ago, similar figures showed that in 1914 the Post obtained 85.8% of its business from firms which had used its columns in 1913.



Of such a condition any business, whatever the product or sales method, might well be proud.

It expresses the consensus of experience of astute buyers, extending over a period of years.

It testifies to the establishment of advertising as an integral factor in economic development—as a profitable investment—not an expense, not a speculation.

It means that manufacturers may invest in advertising in full confidence of substantial return.

It reflects the stability, the soundness, the permanence, of advertising today.

THE CURTIS PUBLISHING COMPANY

Independence Square, Philadelphia

The Ladies' Home Journal

The Saturday Evening Post

The Country Gentleman

MAY 23 1916

BETTER FRUIT

VOLUME X

MAY, 1916

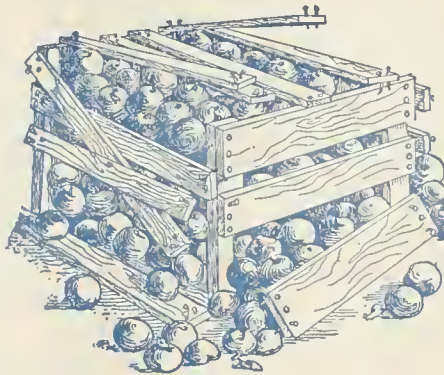
NUMBER 11



BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

Subscription \$1.00 per Year in the United States; Canada and Foreign, Including Postage, \$1.50.

Single Copy 10 Cents



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

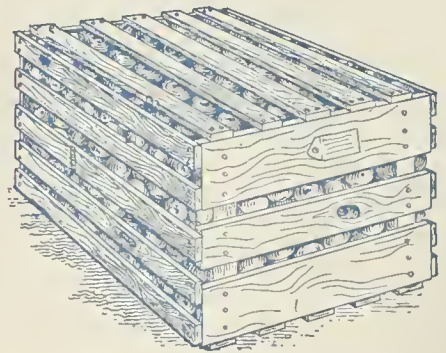
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles



AFTER use of C. F. & I. Co.'s
Cement Coated Nails.

The First National Bank

HOOD RIVER, OREGON

A. D. MOE - - President
E. O. BLANCHARD - Cashier

Capital and Surplus \$125,000
Assets Over \$500,000

Member Federal Reserve System

Live Agents Wanted.
Others Save Stamps.



This wonderful machine will mark a box of fruit in one second. Puts on all the stamps at one operation. Send for literature. Its free.

Practical Box Marker Co.
Otis Orchards, Wash.

Pacific Coast Agents
United States Steel
Products Co.

San Francisco
Los Angeles
Portland
Seattle



J.C. Pearson Co., Inc.
Sole Manufacturers

Old South Bldg.
Boston,
Mass.

PEARSON

ECONOMY in buying is getting the best value for the money, not always in getting the lowest prices. PEARSON prices are right.

ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.

ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

NAILS

LESLIE BUTLER, President
TRUMAN BUTLER, Vice President
C. H. VAUGHAN, Cashier

Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital \$100,000.00

4% Interest Paid in our Savings Department

WE GIVE SPECIAL ATTENTION TO GOOD FARM LOANS

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

Things We Are Agents for

KNOX HATS
ALFRED BENJAMIN & CO.'S
CLOTHING
DR. JAEGER UNDERWEAR
DR. DEIMEL
LINEN MESH UNDERWEAR
DENT'S AND FOWNES'
GLOVES

Buffum & Pendleton

311 Morrison Street
PORTLAND, OREGON

SIMONS, SHUTTLEWORTH & CO.

LIVERPOOL AND MANCHESTER

SIMONS, JACOBS & CO.
GLASGOW

GARCIA, JACOBS & CO.
LONDON

Agencies and Representatives in Every Important European Market

European Receivers of American Fruits

FOR MARKET INFORMATION ADDRESS

Simons, Shuttleworth & French Co.
204 Franklin Street, New York

Simons Fruit Co.
Toronto and Montreal

Simons, Shuttleworth, Webling Co.
46 Clinton Street, Boston

OUR SPECIALTIES ARE APPLES AND PEARS

The Old Reliable

BELL & CO.

Incorporated

WHOLESALE

Fruits and Produce

112-114 Front Street
PORTLAND, OREGON

W. H. DRYER

W. W. BOLLAM

DRYER, BOLLAM & CO.

GENERAL
COMMISSION MERCHANTS

128 FRONT STREET

PHONES: MAIN 2348
A 2348

PORTLAND, OREGON

Mark Levy & Co.

COMMISSION
MERCHANTS

Wholesale Fruits

121-123 FRONT AND
200 WASHINGTON ST.
PORTLAND, OREGON

LEVY & SPIEGL

WHOLESALE

FRUITS AND PRODUCE

Commission Merchants

SOLICIT YOUR CONSIGNMENTS

Top Prices and Prompt Returns
PORTLAND, OREGON

STORAGE

Ship your Furniture
to us to be stored
until you are located

TRANSFER & LIVERY CO.
Hood River, Oregon

BUY AND TRY

White River Flour

MAKES

**Whiter, Lighter
Bread**

Richey & Gilbert Co.

H. M. GILBERT, President and Manager.

Growers and Shippers of

**YAKIMA VALLEY FRUITS
AND PRODUCE**

Specialties: Apples, Peaches,
Pears and Cantaloupes

TOPPENISH, WASHINGTON

Established 1893

W.P. KRANER & CO.

Importers and Tailors

2nd Floor Couch Bldg.

109 Fourth Street

Portland, Ore.

Geo. E. Kramer

C. W. Stose

Orchardist Supply House

Franz Hardware Co.

HOOD RIVER, OREGON

W. van Diem

Lange Franken Straat 45, 47, 49, 51, 61
ROTTERDAM, HOLLAND

European Receivers of American Fruits

Eldest and First-Class
House in this Branch

Cable Address: W. Vandiem
A B C Code used; 5th Edition

Our Specialties Are

Apples, Pears, Naval Oranges



The Law says KILL 'EM

Did you know there's a California law compelling all persons to rid their land of ground squirrels? But law or no law, you're alive to the damage these pests do to crops and trees and land. You want a cheap, easy way to fight them.

KILMOL
SQUIRLOGOPHENE

Will Kill 'Em All



KILMOL
SQUIRLOGOPHENE

Kilmol in the United States Destructor Gives 100% Efficiency. Invented by U. S. officials.

It is simple, sure, quick and practical. Saturate a waste ball in Kilmol, place it in burrow and after 3 or 4 minutes ignite. The deadly fumes remain in the burrow for hours—the rodent can't escape, 100 per cent efficient. Results guaranteed or money refunded. Used by Government, State and County officials. We sell waste balls—better and cheaper than home-made. Write for interesting information about squirrel and gopher eradication, and also ask about new U. S. Government formula of poisoned barley.

OREGON DISTRIBUTOR

Portland Seed Co.
Dept. L Portland

WASHINGTON DISTRIBUTOR

James & Hanes
Dept. L Spokane



Sixteen Years Old

For sixteen years this seal has stood for protection to the shipper. Don't make a mistake of signing up your tonnage now — the "Distributors" and "Sales Agencies" will be just as eager to do business with you later—Don't let that worry you. Meantime investigate and see if our Service will not help you to do your own marketing—To investigate first is wise.

Our new Souvenir Calendar is now ready, containing photographic views of our New York and Chicago offices, extracts from the "BLUE BOOK" Trading Rules, Fruit and Produce Grades, Law of Commerce, Historical Review of the Organization and other information of practical every day value to shippers. It will be sent free to any shipper who handles five cars or more in a season, who will fill in and mail following coupon.

Produce Reporter Co.,
Chicago, Illinois.

Mail Calendar to.....

Town..... State.....

We ship.....cars of.....

Ship through.....

Announcement of Office and New Representative for the Northwest for The Packer

I beg to advise the Associations, Shippers and Dealers of fresh, dried and canned fruits and vegetables, butter, eggs, poultry and produce generally that I have been appointed Northwest Representative of The Packer, in charge of correspondence, advertising and subscription business of the Northwest of this publication.

I trust that you will favor me with news matter concerning your association and business for publication in The Packer.

Kindly put my office on your general mailing list.

To make this office a success I trust you will favor me with your advertising and subscription business for The Packer, as I am sincerely anxious to make a success of my new venture. Yours respectfully,

CHRIS. R. GREISEN, 316 Broadway Building
PORTLAND, OREGON

"BLUE RIBBON"

(EXTRA FANCY)

"RED RIBBON"

(FANCY)

Quality Brands of Yakima Apples

When ordering apples specify Blue Ribbon Brand and be assured of the best the market affords. All apples packed under our personal supervision and inspection.

WRITE FOR INFORMATION
AND PRICES

Yakima County Horticultural Union

FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON

True-to-Name Nursery

GALLIGAN BROS.
Proprietors

Hood River, Oregon Dufur, Oregon

Growers of high grade nursery stock, guaranteed true-to-name. Breeders and importers of pure-bred Big Type Poland-China Hogs. Service boars, bred gilts and weaning pigs for sale.

For catalog of nursery stock and prices on swine, write

True-to-Name Nursery

HOOD RIVER, OREGON

"Carco" KILLS MAGGOTS

A wonderfully successful spray for destroying maggots, grubs and worms which infest TURNIPS, RADISHES, BEETS, RUTABAGAS, CAULIFLOWER, CABBAGE, ONIONS, etc., and also recommended for combating crown borers in STRAWBERRIES.

This remedy has been tried out at Experiment Stations by Horticultural Inspectors and leading growers, who are highly pleased with results.

For Sale by All Leading Seed Houses on Pacific Coast. Ask for it.

Manufactured ONLY by

Standard Chemical Company
TACOMA, WASHINGTON

(Send for Circular)

BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Revolving the Consumer's Dollar Backwards or the Elements that Enter Into the Consumer's Orange Price.

By G. Harold Powell, General Manager California Fruit Growers Exchange, Los Angeles, California, Delivered before the Twelfth Annual Meeting of the Western Fruit Jobbers Association of America, Memphis, Tennessee, January 16-19, 1916.

THE American consumer pays annually from \$75,000,000 to \$85,000,000 for the California citrus fruit crop of 20,000,000 boxes. The retail cost of distributing the fruit to the consumers varies from \$25,000,000 to \$30,000,000, including the net profit of the retailer. The jobber's cost of distributing the fruit to the retailer, including his net profit, varies from \$6,000,000 to \$8,000,000. The railroads receive approximately \$17,000,000 to transport the fruit from California. The cost of selling by the producers to the jobbers on a non-profit, co-operative basis is approximately \$1,000,000; the cost of national advertising is \$350,000. This leaves a return to California of \$30,000,000, out of which the grower must pay the cost of production and of preparing the fruit for shipment.

Revolving the Consumer's Dollar Backwards

Stating the problem differently: When the consumer buys a dollar's worth of citrus fruits this dollar splits up approximately into the following elements when revolved backwards to the producer:

The retailers' gross margin, 27% to 35% of the consumer's dollar;

The jobber's gross margin, 8% to 8½% of the consumer's dollar;

The railroad's gross earnings, 20% to 23% of the consumer's dollar;

The non-profit, co-operative distribution from producer to jobber, 1% to 1½% of the consumer's dollar;

National advertising, .5% of the consumer's dollar.

The crop brings to California from 35% to 40% of the consumer's dollar, of which the fruit on the tree gets 25% to 27% or more.

Operating Costs and Profits

The operating costs of the retailer, the jobber, the railroads and the producer are largely fixed. They are independent of the value of the fruit. They represent the cost of producing the fruit; of railroad and refrigeration service; of delivery by the retailer and jobber; the jobber's selling cost to nearby retailers; the jobber's cost of developing trade with the countless retailers in the small outlying towns and country places; and the cost of rent, management, buying, credit losses and expenses, heat, light, telephone, taxes, interest and other miscellaneous expenses, including losses from decay and stealing.

Whether the jobber or retailer makes a net profit depends on the buying and selling price, the cost of doing business, the volume and the number of capital turn-overs.

The railroad's gross earnings are always the same, as the rate per hundred pounds is fixed.

Whether the producer makes a profit depends on the quality of his fruit, the yield of his grove, the amount expended in production, including the management of his place, the efficiency

bulk of the crop, either direct or at auction, to 2,500 to 3,000 carlot jobbers in the principal cities of the United States and Canada.

The jobbers assemble and distribute the fruit, either direct or through 7,500 traveling salesmen, to 300,000 retail dealers, including grocery stores, chain and department stores, popular stores, general merchandising stores, drug stores, restaurants, hotels, fruit stores, push carts, wagons, stands and other miscellaneous avenues of distribution. The jobber is a banker for the retailer in addition to the functions outlined above.

The retailers distribute the fruit to 100,000,000 people, one-half of whom live in villages of 2,500 or less, and on the farm.

The consumer buys the fruit over the counter, by telephone, through order takers, from the push carts, street stands and in other ways, the great bulk of the fruit passing through the grocery stores or other stores from which he gets his daily food supplies.

This machinery represents the simplest form of distributing an American agricultural crop. In most industries, the producers are not organized. The crop is distributed largely through unorganized local buyers, by representatives of jobbers, by brokers or others who make a profit on the distribution to the jobbers or wholesale dealers, thereby imposing an unnecessary expense of two, three and even ten times as much as the systematic distribution of the organized producer, and at the same time giving only an inadequate distribution.

Are the Jobbers and Retailers Necessary?

One cannot contemplate the vast machinery that bridges the span between the producer on the one hand and one hundred million consumers on the other, without asking the question, "Is every link in the chain necessary to serve the interests of both the producer and consumer, and, if so, are their interests efficiently and economically served?" The answer is being sought in every part of America at the present time through investigations by producers and consumers, by various kinds of organizations and by the state and federal governments. If the jobber and retailer are performing a vital service in bridging the gap and are doing it efficiently and economically, then each has an economic justification



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of his general management, and the selling price. It costs the grower an average of \$1.29 to produce, harvest, pack and place a box of oranges on the cars in California. It costs the lemon grower an average of \$1.90 per box. It may be interesting to note that the elements that enter into the cost of producing oranges and placing them in the hands of the jobber generally divide approximately as follows: Labor, 14.8%; materials, 23.3%; harvesting, 4.6%; packing, 11.3%; freight and refrigeration, 10.0%, and selling, 3.0%.

The Machinery Which Distributes the California Citrus Fruit Crop

The machinery which carries the citrus fruit crop from the producer to the consumer begins with 11,000 California growers, who, through their own agencies, distribute and sell the

and each will continue as part of the distributing system as long as he continues to perform the service in this way. Wherever a better link can be forged then a part of the present chain will drop out, whether it relates to a service performed by the producer, the jobber or by the retailer.

A Study in Distribution by the Citrus Fruit Industry

The California citrus industry has been studying its own distributing problem, because the production of oranges and lemons is increasing much more rapidly than the population. The Valencia shipments, which now equal 12,000 earloads, will double in a few years. The lemon shipments of 8,500 earloads will more than double in the near future and California will supply more lemons than the present total consumption of Canada and the United States, including imports. There are more than 40,000 acres of Washington navel oranges four years old or under, which will soon come into bearing, and will materially increase the navel shipments. The problem of the California citrus industry is first to develop a product of quality, then to create a larger consumer demand, and finally to adjust its distributing operations to the jobber and the retailer so that the supply may be uniform and the consumer demand can be efficiently filled and promoted by the producer, the jobber and the retailer working together. Looked at from its broadest aspect, the problems of the producer, the jobber and the retailer are intimately connected, and are all of the same character—a problem of efficient, economical distribution to fill a larger demand which must be developed on the part of the consumer. There can be no fundamental antagonism between the citrus fruit producer, the jobber and retailer if they understand each other's problems.

The Details of the Investigation

The investigation of the cost of distributing the citrus fruit crop has extended over two years in the principal cities of the United States and Canada. It has been made through the co-operation of the jobbers and retailers, with agents of the industry located in these places. Recently the investigation has been extended to the rural districts, where one-half of the population resides. The method of the investigation follows: Beginning in January, 1914, the agents, starting with the delivered price to the jobbers of oranges varying in size from 80s to 360s, and lemons varying from 270s to 420s, of all grades, determined the price which the leading jobbers in each place charged the retailers for these sizes and grades, and

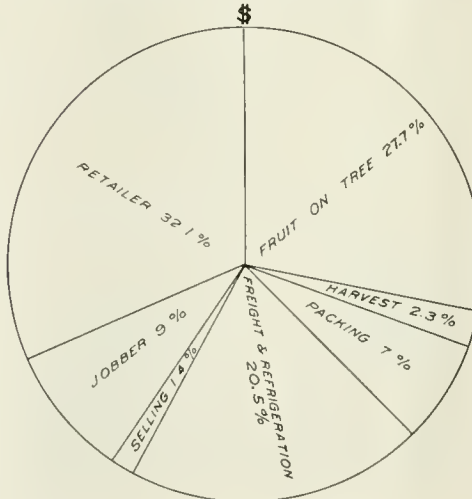
then determined the price which the retailer charged the consumer. The data have been accumulated on all sizes and grades for two years, and 12,000 price reports have been brought together in this way. Supplemental to this general investigation a large amount of information has been furnished by jobbers and retailers who have given the records of their distributing costs from their books.

In this report, representative periods in 1914 and 1915 are selected to show the factors that enter into the consumer's price when a dollar's worth of oranges are purchased from the retail dealer.

The Consumer's Dollar, 1914

From April 15, 1914, to December 1, 1914, twenty-eight representative cities are selected, including 3,265 jobbing and retail prices. This period covered low prices on both Navels and Valencias. The average price paid by the consumer was approximately 37½ cents per dozen for all sizes of the grades included in the reports. The factors entering into the consumer's dollar under these conditions are shown in the chart and table following:

The Consumer's Dollar, Oranges, April 15 to December 1, 1914



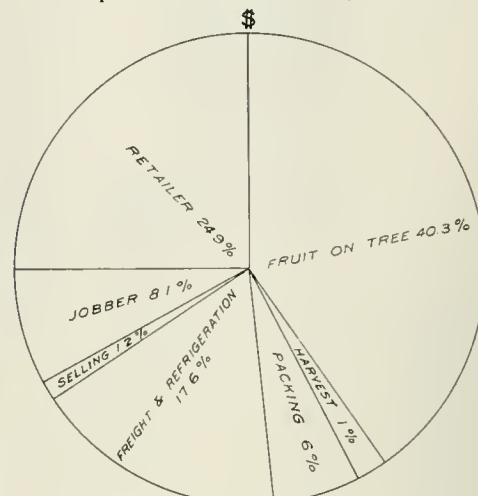
	Per Box	
Fruit on tree.....	\$1.2896	27.7%
Harvesting .....	.1058	2.3%
Packing .....	.3246	7.0%
Selling .....	.0660	1.4%
F.O.B. California	\$1.786	38.1%
Freight and refrigeration....	.954	20.5%
Delivered price	\$2.74	58.9%
Jobber's margin (gross).....	.42	9.0%
Jobber's price	\$3.16	67.9%
Retailer's margin (gross)....	1.19	32.1%
Consumer pays	\$4.65	100.0%

The Consumer's Dollar, Oranges, 1915

The period from April 15, 1915, to December 1, 1915, includes 34 cities and 4,138 jobbing and retail prices. This period represents a higher price for the fruit of both Navels and Valencias, the consumer paying an average of 43½ cents per dozen for the oranges of the grades included.

The factors entering into the consumer's dollar under these conditions are shown in the chart and table following:

The Consumer's Dollar, Oranges, April 15 to December 1, 1915



	Per Box	
Fruit on tree	\$2.1896	40.3%
Harvesting .....	.1058	1.9%
Packing .....	.3246	6.0%
Selling .....	.0660	1.2%
F.O.B. California	\$2.686	
Freight and refrigeration....	.954	17.6%
Delivered price	\$3.64	
Jobber's margin .....	.41	8.1%
Jobber's price	\$4.08	
Retailer's margin	1.35	21.9%
Consumer pays	\$5.13	

The Retail Distributing Cost

The retail distribution of the citrus fruit crop to 100,000,000 consumers is naturally the most costly, because it represents a service to a vast number of unorganized people, performed by a vast number of factors, the smaller of which are almost equally unorganized. It has been shown by Mr. C. C. Parlin, Chief of the Research Laboratory of the Curtis Publishing Company, that the average cost of doing the retail food business of the United States is 17% on the selling price, while the average net profit is 3%, making a gross cost of 20%. The figures developed in the retail citrus investigation show a gross profit of 32.1% on the low selling price in 1914, and 24.9% on the higher selling price in 1915.

The cost of handling a perishable fruit that is subject to decay and deterioration, is naturally higher than the cost of handling semi-perishable and non-perishable food products. The excess cost which is inflicted on the retailer from decay depends primarily on the care with which the fruit is handled by the grower in preparing it for shipment and on the rapidity of his stock turn-overs. It is well known that the fruit business, along with many other products, returns a relatively high profit to the retail dealers because half or more of the value of the goods sold through the store, including sugar, flour, sometimes butter and other articles, are often handled without profit and sometimes below the cost of handling. This condition inflicts on the consumer a somewhat higher price on fruits and vegetables because the retailer's net profit must be made on one-half the goods passing through his store.

A Manager Wanted

I require a manager for my 100-acre orchard (3 years old), within 15 miles of the city of Melbourne, Australia, population 600,000. (Good roads.) I need a competent man to take full charge as I am in business in the city. Therefore, any applicant must have a thorough knowledge of the fruit industry and give excellent references. Address S. Stott, "Viewbank," Burke Road, East Malvern, Victoria, Australia.

Number of Stock Turn-overs

The thing that is of primary interest to the producer and the jobber is whether the retail dealer turns his stock over in the quickest possible time and thereby gives the maximum distribution of fresh fruit to the consumer and at the same time reduces decay and waste to a minimum. With the fruit stores, popular stores, stands and better grocery stores, there is little question but that every art known to the merchant is used to promote quick sales because the progressive merchant knows that his net profit at the end of the year depends on the number of turn-overs he gives his capital.

But with the country merchant and the small retailer who carries a box or two under the counter or in an inconspicuous place in the store, the answer is not so clear. Here is an opportunity for continuous and sympathetic co-operation between the producer, the jobber and his traveling salesmen in developing the best retail fruit displays, the best retail merchandising methods which will attract the consumer, in helping the retailer strengthen his strategic position of personal contact with the consumer and thereby giving wider and quicker distribution. One-half of the consumers of the country are served by the small town and country merchants. Oranges and lemons are self-sellers if artistically displayed. We know that many jobbers co-operate with the retailer and conduct an educational campaign among them. One leader among the retail merchants of a community is a powerful example in good merchandising methods. Whatever he does, the others are likely to do. Here is an opportunity that the jobber can promote through his salesmen by developing a

frank co-operation with the retail merchant, and in developing pacemakers among the retailers. It is an almost undeveloped field in the average small town or country district. Dealer service aids in the form of artistic window displays, which make the consumer a friend of the store and create a desire for the fruit, mass displays of citrus fruits with other fruits and vegetables, which should be the central feature of the grocery store because of the profit to the dealer, and local advertising as supplemental to national advertising—these are the lines of effort that are most likely to show returns in the smaller towns and country districts. They are the lines that give the maximum distribution—an increased outlet for the producer, a larger business for the jobber and a profit to the retailer.

The Jobber's Cost of Doing Business

The average jobber's gross profit for distributing citrus fruits to the retail dealer is not above the average jobbing cost of distributing food products as a whole. It has been shown by Mr. Parlin, from extensive data secured from all parts of the United States, that the local food jobbers doing a business of \$500,000 or under, usually have a cost of 5½% to 6½%, while those doing a business of \$500,000 to \$1,500,000 have costs of 7% to 8%, while the sectional jobber whose volume of business varies from \$2,000,000 to \$8,000,000 usually has a cost of 8% to 9%.

From the data which the citrus industry has secured it is evident that the average fruit jobber averages a gross profit of 10% to 13% on the selling price, including decay losses. This is probably not far from the gross margin of the average food jobber.

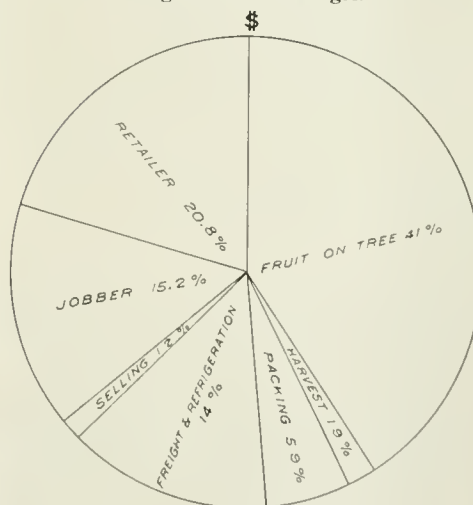
The average fruit jobber is performing a vital economic service as a banker, an assembler and distributor of fruit. What is needed is less radical discussion of the jobber and a better mutual understanding of the problems of the producer, the jobber and the retailer, to the end of a better working relationship in solving the big problem that affects all, i. e., the wider distribution of the rapidly-increasing fruit crop.

Abnormal Gross Margins

The jobber problem, however, is not without its less favorable aspects in some districts where competition does not have full play. Here the jobbers often try to lessen competition by gentlemen's agreements or other forms of understanding. They impose a high gross profit on every box of citrus fruits sold in the city and occasionally in the country districts. These arrangements may not adversely affect the price which the grower receives, but an analysis of the record shows that the high margins restrict consumption, the merchant making his profit on a few turn-overs at a high net profit on each, rather than a larger number of turn-overs with a low net profit on each. This system of merchandising restricts distribution and is therefore detrimental to the citrus industry.

The chart and table following show the elements that enter into the consumer's dollar in a district where the jobbers depend on high margins and a few turn-overs in the sale of oranges:

The Consumer's Dollar Showing a High Jobber Margin



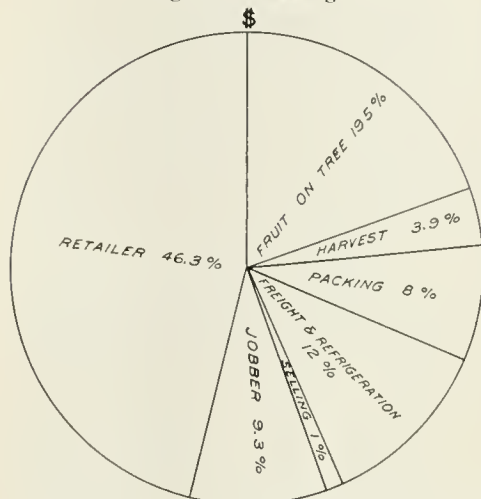
	Per Box	
Fruit on tree	\$2.2636	41.0%
Harvesting	.1058	1.9%
Packing	.3216	5.9%
Selling	.0660	1.2%
F.O.B. California	\$2.76	50.0%
Freight and refrigeration	.77	14.0%
Delivered price	\$3.53	64.0%
Jobber's margin	.84	15.2%
Jobber's price	\$1.37	79.2%
Retailer's margin	1.15	20.8%
Consumer pays	\$5.52	100.0%

The chart and table following show the elements that enter into the consumer's dollar in a district where the retailer depends on high margins and few turn-overs in the sale of lemons:



The picture shows the new Hudson Super-Six. This is the car with the patented motor, which is vibratorless. The Super-Six, on the Sheephead Bay Speedway, last November, created new stock car records for speed, durability and acceleration, under American Automobile Association supervision. The Super-Six is by far the handsomest, roomiest and most luxurious car yet produced by the Hudson factory. The demand for the Super-Six is the greatest in the history of the Hudson factory. The plant has been doubled to produce 30,000 Super-Sixes this year.

The Consumer's Dollar Showing a High Retail Margin



	Per Box	
Fruit on tree	\$1.154	19.5%
Harvesting	.292	3.9%
Packing	.596	8.0%
Selling	.077	1.0%
F.O.B. California	\$2.419	32.4%
Freight and refrigeration	.891	12.0%
Delivered price	\$3.31	44.4%
Jobber's margin	.69	9.3%
Jobber's price	\$1.00	53.7%
Retailer's margin	3.15	16.3%
Consumer pays	\$7.15	100.0%

per cent. In the West, the Northwest, in Canada and in the Southern States, where distances covered by a jobber are great, all expenses—rents, wages, telephone and telegraphic costs, traveling salesmen, delivery and other expenses incidental to the development of a small town and country trade—make the operating cost often twice as large as in the more densely populated Eastern States.

Fluctuations in the Shipper's, Jobber's and Retailer's Prices

There is a widespread popular impression that the retail price of citrus fruits remains the same throughout the year, irrespective of the price which the retailer pays for the fruit. There is a less widespread impression that the jobber charges the retailer about the same per box irrespective of what he pays the producer for the fruit.

We have charted the producer's price, the jobber's price and the retailer's price on identical sizes and grades of oranges for two years. These figures cover thirty-four principal markets. They do not include the small towns and country trade. The fluctuations in these prices are shown in the following diagram:

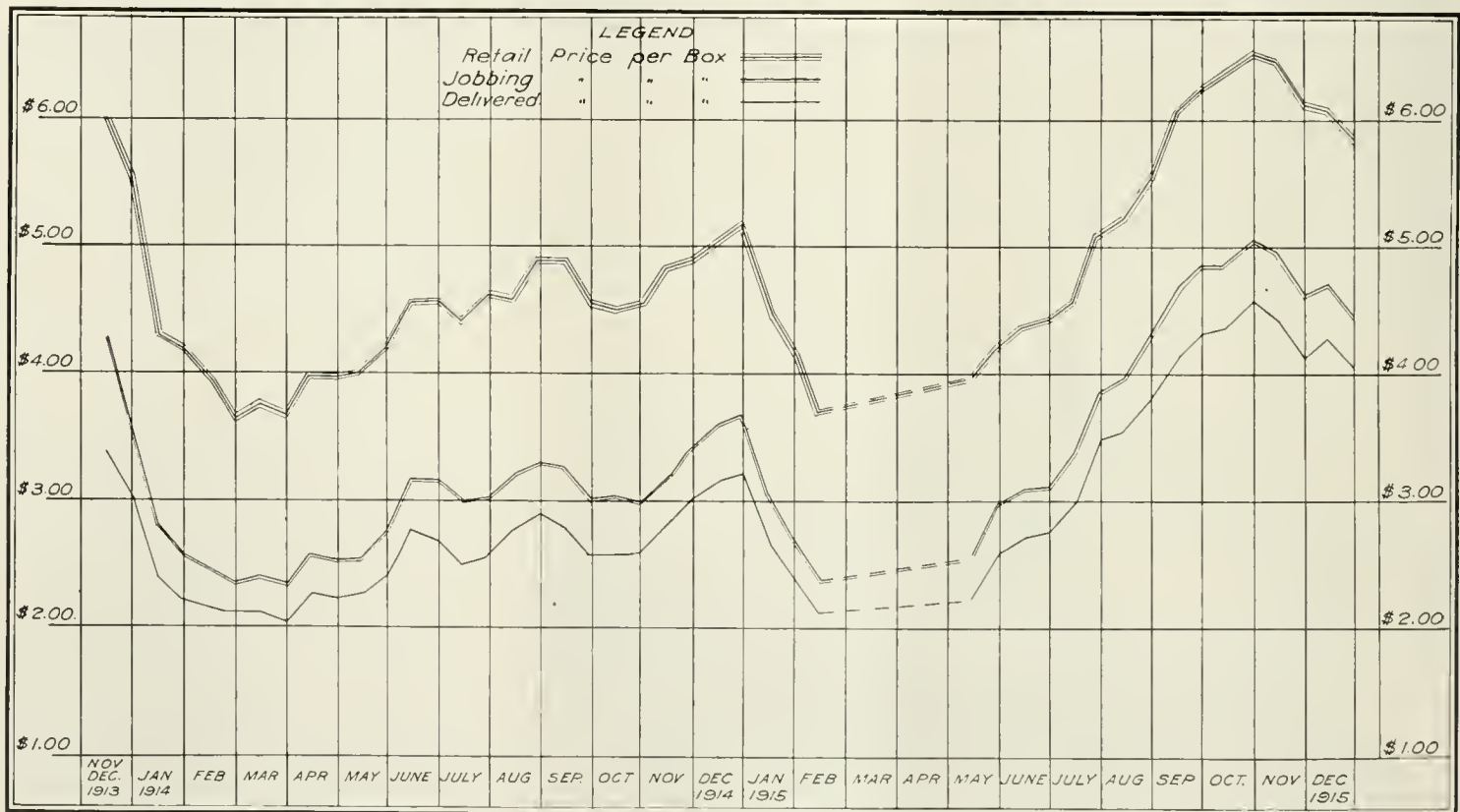
rule applies with equal force to the retail trade.

Prices May Apparently Be Uniform

There is a condition in the citrus fruit business that makes uniform prices to the retailers and consumers sometimes apparent. That is the variety of grades and sizes with which the jobber or retailer may supply his customer's wants. The orange retailer, for example, may charge a uniform price of 40 cents per dozen for weeks at a time, but he has varied the grades and sizes to fit the uniform retail price. The jobber has also the same opportunity in filling the retail orders. A price investigation which is not made on identical sizes and grades is misleading and worthless for economic conclusions.

Lemon Prices Fluctuate Less Than Oranges

While the jobber's and retailer's prices on oranges follow the delivered price with close regularity, the same condition is not always true of lemon prices. The reason is that the lemon is largely a speculative product rather than a staple product like the orange. The principal use of the lemon is in cold drinks in the summer time. The fruit can be safely stored for weeks



Costs East and West

The investigation shows a wide variation in the costs of doing business in different parts of the country. In the densely populated sections east of the Mississippi, operating costs are comparatively low. Rents are lower, interest rates, wages, the expense of traveling salesmen and other expenses are lower, sometimes by two or three

From this chart it will be seen that the three prices follow each other with almost mathematical exactness. Competition among the jobbers and among retailers brings this about. The jobber is keen for trade, and when the buying price rises or falls he is forced through competition to fluctuate his selling price to correspond. If he does not do this, his more aggressive competitor takes the business from him. The same

and the jobber and retailer sell the lemon at relatively higher margins. With the development of more general uses of lemons through national advertising, such as culinary uses, health and toilet uses, the lemon will be made a more staple product. The speculative element will grow less important, the merchant will obtain his supplies as needed, and the jobbing and retail prices will follow the delivered price

with greater regularity. Now the speculative handling of the lemon is a distinct drawback to its widest distribution.

General Considerations

We have touched only the high spots in the investigation of the cost of distributing the citrus fruit crop. The California citrus industry is vitally interested in the problems of the jobber and the retailer. The industry realizes the economic necessity of each in the distribution of its product to the American consumer. The industry can thrive only when the consumer demand keeps pace with the increase in production. The jobber and retailer can thrive only when there is an active consumer demand. The problem of the industry, therefore, is to produce oranges and lemons of good quality, because no food industry can permanently prosper except on a basis of quality. The second problem lies in co-operating with the jobber, the retailer and with every effective factor of publicity in creating an increasing consumer demand. The third lies in developing the most effective merchandising methods whereby the consumer demand may be quickly filled and stimulated. The jobber and retailer must of necessity be vitally interested in the same problems, because they thrive only when the consumer is an active buyer and when the producer has a high-grade product to sell. No more than the producer can the jobber or retailer live unless he makes a fair profit, nor can he develop the best kind of merchandising unless his profits are commensurate with his efforts.

The industry is interested with the jobber and retailer in the most perfect system of distribution that can be devised so that the entire crop can be handled on an orderly merchandising basis from the producer to the consumer. At the present time there is a lack of systematic distribution because producers as a whole are inadequately organized.

Whenever prices are low and the investment of the producer is jeopardized, then the ghost of the jobber and other distributing agencies stalks the earth. The ignorant man and the demagogue alike then demand that the American system of distribution be revolutionized; that somebody be eliminated; that the products of the soil be distributed more directly and economically to the consumer. That the system of handling farm products is wasteful and costly no student of distribution can overlook. The farmer is unorganized, except in industries like the California citrus industry. His products are not standardized. The distribution, unless organized, is speculative and chaotic. The jobbers are often unorganized; the retail trade as a whole is as little organized as the average agricultural industry.

Through organizations like the National League of Commission Merchants, the Western Fruit Jobbers' Association of America, the National Wholesale Grocers' Association, the

National Retail Grocers' Association and state and local organizations, there should gradually develop a better mutual understanding of the questions of the producer, the jobber, the retailer and the consumer, and a more effective co-operation in solving their common problems. The American consumer holds the key that unlocks each of

these problems. It is our purpose to define the citrus problem as clearly as we see it and to co-operate with the jobber and retailer in the development of the most efficient merchandising methods in giving the widest possible distribution to oranges and lemons in response to an increasing consumer demand.

Developing the By-Products Industry

By Paul H. Weyrauch, Walla Walla, Washington

THE development of the by-products industry in this great Northwest is still in its infancy, and yearly enormous quantities of various fruits and vegetables are going to waste. How to prevent, or take care of this waste, is the question of the hour, and the problem is one that is deserving of the greatest consideration by all those interested in the future of the Northwest. The conversion of this waste or raw material into any one of the finished by-products, such as canned fruits, vegetables, dried fruits, jams, jellies, preserves or syrups, requires considerable technical knowledge and a great deal of practical experience. There are in the Northwest few men who possess the technical knowledge required, and who have also had the practical experience which is indispensable. This is one of the reasons why so many of our canning and other by-products plants have failed to make good. Another and even more important reason for these failures is the lack of cooperation. Owing to the lack of cooperation there has been in many instances a duplication of plants of a similar nature within a limited territory. This is particularly true as far as vinegar factories are concerned. The consumption of sweet cider and of vinegar is naturally limited, and owing to its bulky nature vinegar can only be shipped comparatively short distances, yet we have more vinegar and cider plants in proportion than we have evaporators and canneries.

The solution of this problem is cooperation by the growers within each fruit-growing district in the Northwest, and in turn cooperation by all the dis-

tricts comprising the Northwest. This cooperation once established will make it possible to care for the greater portion of the raw material now going to waste. It will be possible under such cooperation to secure for this territory the services of the very best processors or cannery men, experts on jams, jellies, preserves and syrups, and experts in the drying or evaporating of fruits. With such experts working under the direction of a central board, it would soon be possible to recommend to each district a line of procedure according to its needs, as well as one that would meet all the conditions of the entire Northwest.

By close cooperation within each district it would be comparatively easy to raise sufficient capital to put up the proper kind of a plant, be it cannery, evaporator or vinegar plant. Since expert advice would always be available, the mistakes made in the erection of these plants in the past would be easily avoided. It would also be impossible for a promoter to foist upon an unsuspecting public an impractical lot of machinery, as has been done in so many instances in the past. There are, of course, in the Northwest a number of successful by-products plants that are



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owned by private capital or stock corporations. An effort should be made to have these successful plants join in this cooperative movement. Wherever this can be accomplished a possible competitor will be eliminated and the technical knowledge and practical experience of the successful operator will be at the disposal of the cooperative organization. I have used the term "successful" advisedly, since an unsuccessful operator can neither be of benefit nor can he be a hindrance to the cooperative movement, while the "successful" operator may be either. For this reason, this movement should make every legitimate endeavor to enlist the interest and cooperation of the owner of existing successful by-products plants.

Under this cooperative plan it will also be possible to adopt certain standards in the various byproducts that it will be found practicable to manufacture. This standardization will greatly facilitate the marketing of the output of these plants. The marketing should all be done by a central organization, which organization successful independent plants should also be invited to join. After a close study of this subject covering a long period, I am firmly convinced that a plan similar to the one thus outlined is not only feasible but practical. We have a splendid example of the great possibilities of a cooperative plant of this kind in the cannery at Puyallup, which is under the successful management of Mr. W. H. Paulhamus, who has probably more canning information "canned" in his spacious cranium than any other individual in the Northwest, and who is unselfishly willing to impart some of his knowledge to others and to allow others to benefit by his experiences.

Great strides have been made in recent years in the improvement of machinery employed in the by-products industries. This applies particularly to the various appliances used in canning. Progress is also being made in the improvement of evaporating machinery, both for the preparation of the fruit to be dried and for the drying process itself. In considering evaporators, it should be remembered, however, that the type of plant to be installed will depend largely upon the conditions obtaining in the district in which the

plant is to be located. A number of evaporating or dehydrating plants are now on the market and much is claimed for each individual type. It is recommended that great care be taken in the selection of any of these new types, and that expert advice be secured before the purchase is made. The selection of the proper machinery for the preparation of the raw material is of equal importance. When it is considered that it requires practically eight pounds of green apples to produce one pound of the dried fruit, and that the eight pounds of the green apples must be peeled, bleached and sliced, before being submitted to the drying process, it will be understood that highly economical methods of preparation must be employed. Excellent paring machines with automatic feeding attachments are now on the market, and self-feeding slicing machines can be purchased. In fact, an evaporating plant can be so arranged that from the time the apple leaves the trimmer it need not be touched until it is ready to go into the kiln, tunnel or cabinet, according to the type of evaporator used.

The markets for our manufactured by-products are both at home and abroad. Reports by those who are considered authorities on this subject, indicate that the marketing of our canned fruits is limited to the markets of the United States and Canada and to England, while our dried fruit can be sold to practically every country in Europe and Asia. The opening of the Panama Canal also offers great opportunities, owing to a material lowering of freight rates and this will naturally have a marked effect upon the industry. In conclusion I wish to say that to my mind the by-products industry is the anchor of hope to the Northwest, and the sooner this is realized, the better and brighter our future will be.

DO FARMERS THINK?

This question was suggested by the inquiry made by the Muskegon Knitting Mills, offering to pay \$10 to anyone who would give them a logical reason for wearing pointed-toed hosiery on right and left feet. They first wrote to their customers, then advertised in the papers and magazines. They have received many replies, but most of them expressed the same idea, which was: "I never thought about my hosiery before."

Judging from the outlines of the feet which many of these parties sent in, they must have suffered untold agonies from bunions, ingrow-

ing toe nails and corns, and yet they never thought.

A man's feet are made right and left. He wears right and left shoes. Sometimes he wears a pointed-toed shoe which crowds his toes and makes them look like the accompanying illustration, but even if he wears the nat-



ural shape shoe, as shown in this illustration, with a pointed-toe sock, he pinches his toes just the same.

You have often noticed that your sock wears out first on the large toe. This is because the great toe is trying to keep straight, while the stocking is trying to pinch it into the middle of the shoe, with the result that the pressure against the sock makes a hole.

The Muskegon Knitting Mills have lately secured a patent on a new idea in hosiery known as Haight's Right and Left Comfort Hose. These are made rights and lefts, the same as the natural shape shoe. They give the wearer the pleasant sensation of being barefoot. They wear even longer than the famous Vegetable Silk Hosiery manufactured by this concern for the last twenty years, and are certainly logical in design. They are made in heavy wool socks for winter, or medium weight vegetable silk, at 50 cents per pair; also different weights of cotton at 25 cents per pair.

The Muskegon Knitting Mills sell their product directly from the mills to the consumer, through the mails, and any reader of "Better Fruit" can secure a sample pair of this modern style of hosiery by sending a money order for the proper amount, with the outline of the foot, to show the size required, to the Muskegon Knitting Mills, Muskegon, Michigan.

Look at the illustration, and decide which foot looks like yours. If you are suffering with bunions, or cramped toes, STOP AND THINK—WHY PINCH YOUR TOES ANY LONGER?—Ad.



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Fruit growers can save big money on the highest grade, open hearth steel fencing from Rice & Phelan, Portland. In spite of a great scarcity and advance in fencing everywhere our warehouses are filled with an advance supply. As long as it lasts you will get the benefit of our foresight.

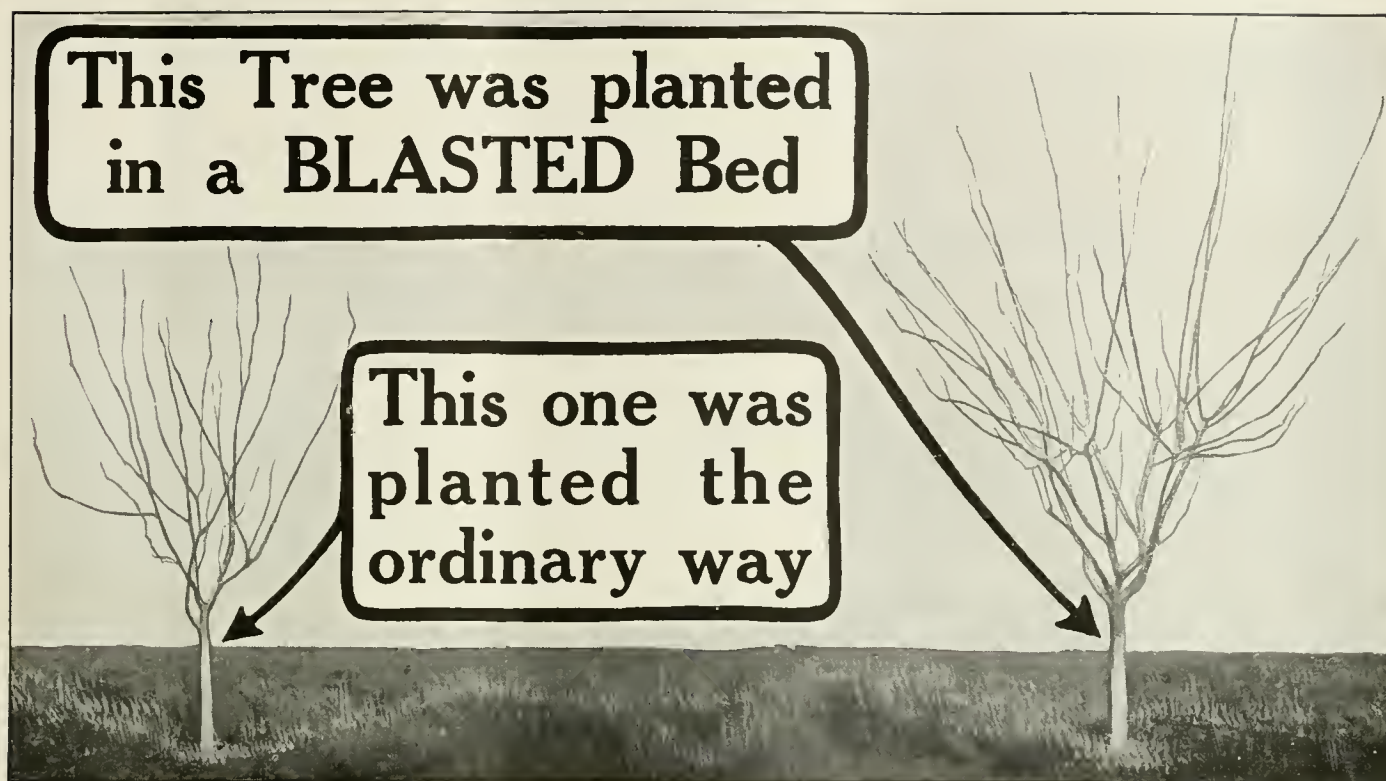
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Over 100 styles of fencing at **unmatchable** prices. We sell more fencing direct to the consumer than any other concern in the Northwest.

Write at once for the **FREE FENCE BOOK**, which also includes thousands of bargains on everything needed for the ranch and the home. Send for it **NOW**.

RICE & PHELAN

WHOLESALE SUPPLY HOUSE
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Herman H. Smidt, R. F. D. 3, Oregon City, Oregon, owner of these trees, read in *Better Fruit* that trees planted in blasted soil would grow faster and be better in every way than trees set in dug holes. He tried it, and on February 14, 1916, wrote as follows:

"I intended to blast the whole orchard but ran out of powder and finished a small balance without it. I am glad of this now because it has enabled me to compare the growth of the trees and satisfy myself that the expense was justified.

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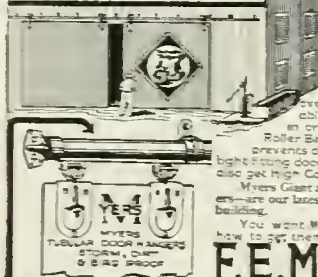
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They roll away the old-time door troubles by preventing and overcoming the balky, off-the-track or frozen-up door. The Adjustable Constriction permits a door to be raised or lowered, or moved in or out, as conditions require—A monkey wrench does the trick. Roller Bearings and Large Trailers insure light operation. Stayon Device prevents door being thrown off the track. Flexible Hinged Joint produces light closing doors. You get all these features on MYERS DOOR HANGERS. You also get High Carbon Flat Stayon Track or Reinforced Girder Tubular Track. Myers Giant and New-way Hangers for Tubular Steel Trac. The All Weather Hangers—our latest production—They add the finishing touch to door service on any building.

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conserved throughout the entire season. This can only be done by pulverizing the soil and continuing to maintain a dust mulch. There are several types of pulverizers on the market which are made of heavy iron rollers, grooved so as not only to cut up clods but mash them very completely. The use of pulverizers is particularly desirable,—in fact practically necessary if the fruit-grower allows his soil to be at all cloddy, which is very likely to be the case where there is clay in the soil. Some pulverizers are made with double rollers following each other; in some cases an efficient seeder attachment goes with the pulverizer which is found very efficient among grain farmers and for crops such as clover, alfalfa, etc., where the seeds are small and not sown very deep. These do much better where the ground is pulverized thoroughly and well rolled. Dry farming has introduced many new implements which are of great value also in countries which are known as semi-humid or humid climates. By thoroughly pulverizing the soil and rolling the surface, very dry climates have been successful in conserving the moisture and have been able to produce very fine crops, while without such methods

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The New Patented Harvey Bolster Springs are made just like the finest automobile springs. They absorb all the bumps, jars and jerks of rough, uneven roads, and change an ordinary wagon into an easy-riding spring wagon. A set on your wagon will enable you to get your perishable produce to market in first class condition all ways. **Insist on Harvey's.** If your dealer can't supply you write us for free catalog and price list.

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IMPROVED ONE-PIECE FOLDING TOP STITCHING the one-piece bottom makes the box open up perfectly. No loss from misfits and breakage as with the old style, and the bottom never drops out.

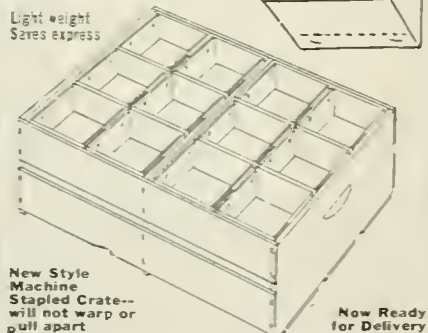
Compare this new box with any box on the market.

PRICES

Folding Halfboxes \$3 per 1,000
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Write for prices in large lots.

Light weight
Saves express



New Style
Machine
Stapled Crate—
will not warp or
pull apart

Now Ready
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PORTLAND SEED CO.



Raisin Industry Increases

The California raisin crop is now about three times as large as that of Spain, according to a recent publication of the United States Department of Agriculture. About 60 per cent of this crop is grown in Fresno County alone. Last year it is estimated that the entire California crop amounted to 250,000,000 pounds. This unquestionably could be greatly increased if the demand warranted it. As a matter of fact, however, it is the practice to produce only enough raisins to supply the existing demand. In this connection it is interesting to note that as the domestic crop has increased, the importations of raisins have correspondingly decreased. In 1885 the imports amounted to over 38,000,000 pounds; in 1915 they were less than 3,000,000.

In the early days of the industry high prices were realized, the average from 1889 to 1893 being about 5 cents a pound. Prices then began to fall, however, until in 1897 raisins were quoted as low as $\frac{3}{4}$ of a cent a pound. The growers then perceived that in order to make the industry profitable coopera-

tion was necessary. The first association disbanded after a career of approximately six years. Another attempt also proved a failure, and it was not until 1912 that a really successful organization was formed. An active effort is being made by this organization to bring raisins into more general use.

Bulletin No. 349 of the United States Department of Agriculture, "The Raisin Industry," has now been published. This bulletin gives much information on the raisin industry, the kind of soil required, the various methods of pruning, the varieties and methods of harvesting and packing. It points out also that as the raisin vines are not resistant to the Phylloxera, in order to make permanent, durable vineyards they should be grown on Phylloxera-resistant stalks.

Pulverize Your Soil Thoroughly

There is no crop which necessitates conserving the moisture more than the fruit crop, and the apple crop in particular, for the reason that apples grow through the entire year up to October or November, and moisture must be

they would not be able to do so. The editor has used a pulverizer in cultivating his orchard, the soil having some clay, and he considers it a very valuable implement.

New Handbook on Land Clearing

Up to this time there has been nothing in print which deals solely with the best methods of removing the stumps in the Pacific Coast states. The books offered by manufacturers nearly always deal with Eastern conditions. Now comes a book which has been prepared especially with Western conditions in view. In type and picture it tells all about the best methods of getting rid of stumps economically and easily. It is published by the Giant Powder Co., Con., of San Francisco, who are the oldest makers of high explosives in America, and who manufacture the Giant farm powders for stump blasting and other farm work. The book is called "Better Stump Removing," and is full of information about high explosives, their selection and use. It tells how to get the best results in blasting out stumps, but it does not neglect to describe other methods of removing them and to tell how they may be used in connection with blasting, if need be. Much of the stump blasting that has been done in the West has been done wastefully. The blasters have ignored what are apparently insignificant details. But it is these little things which make the difference between profitable and unprofitable clearing, and which run up the cost. Land can be cleared by proper methods with ease, speed and at low cost. The book explains how. It is sent free on request.

Automobile Owners Receive Good News

The greatest boon to the automobile owners has just been given them recently in the form of a tire constructed of double the thickness of such tires as Diamond, Goodyear, Firestone and other standard makes. This added thickness in wearing surface makes the tires the best on the market today for real service, as they are puncture-proof and withstand great wear and hard service. Notwithstanding the many added features of these tires, they are being sold now as an introductory offer at a price about 40% lower than the regular price of standard tires. These tires bear a 7,000-mile guarantee, which is also double that of the regular made standard goods. These tires are being sold direct to the consumer by the Double Service Tire & Rubber Company of Akron, Ohio.—Adv.

THE LIGHTEST OF MICHIGAN SAND LANDS ARE NOW BEING MADE AS VALUABLE AS THE BEST CLAY LANDS IN OREGON

The Hood River fruit growers will be interested in knowing that the "pine barrens" of Michigan are now being reclaimed, and made to produce the highest grade of fruit, and as much wheat or clover hay as the best lands in Oregon.

Lonis P. Haight, editor of "The Sand Farmer," has conducted thousands of experiments at the Haight Demonstration Farm during the past fourteen years, and has discovered the secret of making sand lands productive.

Not a "Mechanical Horse"

The first automobiles were spoken of as "horseless carriages." When they began to supplement horses instead of replace them—to do things impossible for horses to do—this term became obsolete.

The Yuba BALL TREAD tractor does the work of horses and it does things impossible for horses to do.

The orchardist uses it to pull tools that horses are unable to handle. He uses the Yuba to handle the heavy double disc cultivator—which at one operation does the work of the horse-drawn weed cutter, tooth harrow, the light single disc and the clod masher—and he gets close to the trees!

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The Yuba BALL TREAD replaces 12 or 18 horses—does more and it achieves results impossible with horses. The catalogue tells why. Send for it.

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Size of Farmacres.

CHECK CROP RAISED

...Fruit... Grapes

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...Alfalfa

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To answer the many inquiries he has been receiving from all parts of the country he is now editing a monthly magazine called "The Sand Farmer," in which he is telling how any sand lands supplied with sufficient moisture can be made to produce as large profits as any other kind of soil. The subscription price is \$1.00 per year, and it is well worth the price to anyone owning sand land.

Mr. Haight is also publishing his new book, "Sand Farming," in "The Sand Farmer." This book gives the result of his years of study and many original and interesting experiments. The price will be \$1.00. Anyone subscribing to "The Sand Farmer" now will get this book free. Ten cents and your address mailed to "The Sand Farmer," Muskegon, Michigan, will bring you a sample copy.—Adv.

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
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All Communications Should Be Addressed and Remittances
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Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

"Revolving the Consumer's Dollar Backwards."—A year ago in the May edition of "Better Fruit" appeared an article on this same subject by Mr. G. Harold Powell, general manager of the California Fruit Growers' Exchange. Those who read the article last year will be doubly interested in Mr. Powell's contribution on this subject this year, as his article which appears elsewhere in this edition shows the difference between the results in 1914 and 1915 for the orange growers of California. While it is not necessary or the intention in this editorial to go into this subject in detail, it seems important to call the attention of the fruitgrowers to a few important facts brought out by Mr. Powell in a comparative way on the 1914 and 1915 crops. In 1914 the orange grower received \$1.2896 per box for oranges on the tree—27 $\frac{1}{10}$ per cent of the consumer's dollar. In 1915 he received \$2.1896 per box, which is 90 cents per box more, or 40 $\frac{3}{10}$ per cent of the consumer's dollar, or 12 $\frac{3}{10}$ per cent more of the consumer's dollar; the harvesting, packing and selling costs, freight and refrigeration per box were the same. It is important, however, to note in connection with this statement that on the increased price the percentage of cost of the consumer's dollar is reduced for the year 1915. The jobber's margin in 1914 was 42 cents; in 1915 it was 41 cents per box, however, showing a reduction of nine-tenths of one per cent in favor of the grower. But perhaps more important than any of the above transactions in handling is the fact that the retailers' profit, which "Better Fruit" and the editor have for years claimed to be too large, was reduced from \$1.49 per box to \$1.35 per box, or 14 cents per box less. In other words, the retailer received 32 $\frac{1}{10}$ per cent of the consumer's dollar in 1914; in 1915 the retailer received

24 $\frac{1}{10}$ per cent. In other words, the retailer made 7 $\frac{1}{2}$ per cent less profit, which went to the profit of the fruit-grower, whom we all know needed it mightily badly. While it must be taken into consideration that these results are obtained in the orange industry, nevertheless they serve as a valuable object lesson to the apple grower, for the reason the orange grower has been getting a much greater per cent of the consumer's dollar for his fruit on the tree than the apple grower ever received, and on top of this in 1914, under the able management of Mr. Powell, in co-operation with the dealers and retailers, through whom the orange growers did business, the grower's per cent of the consumer's dollar last year was increased from 27 $\frac{1}{10}$ per cent in 1914 to 40 $\frac{3}{10}$ per cent in 1915, which, in connection with the increased price received by the orange grower, gave the orange grower for the year 1915 90 cents more per box for oranges on the tree.

Just what this would mean in the apple business in a general way for the Northwest is difficult to say at the present time, for the reason that no average figures have ever been compiled showing definitely what the apple grower got out of the consumer's dollar, neither is the percentage for the apple industry paid for harvesting, packing, selling, refrigeration, jobbers' and retailers' portion known in a definite way. Some work along this line would be the most valuable kind of work that could be done for the industry in the Northwest. There is no question but what it would result in some costs which are now exorbitant being reduced, which would mean that the fruitgrower would receive a greater proportion of the consumer's dollar than he has ever received in the past. Without question it is a fact that the apple grower does not get the same percentage of the consumer's dollar as the orange grower. One apple grower who put out a high-class product of high-priced varieties received an average of 60 cents per box in 1914. If the apple industry showed the same improvement in 1915 in the way of prices that the orange industry showed, the apple grower would get 90 cents more per box in 1915, or, in other words, he would get \$1.50 per box. If this apple grower gets \$1.25 per box he will probably consider himself fortunate. The apple industry should be able to secure for the grower just as high a per cent the consumer's dollar as the orange industry. This is a great big problem that is before the apple industry of the Northwest today. It is a problem that everybody should interest himself in solving. It is a subject which every fruitgrower, every salesman, every banker and business man and everyone connected with the industry should study and endeavor to solve. It can be done because the orange growers have done it. It must be done before the apple grower will get what he is entitled to.

Community Packing House.—The subject of community packing houses is being discussed in many fruit districts of the Northwest. Therefore it is with considerable pleasure that "Better Fruit" presents a timely article, which appears elsewhere in this edition, by Mr. S. V. Beckwith, manager of the Rogue River Fruit and Produce Association, which contains some very interesting and valuable information. The growers are fully impressed with the necessity and importance of standardization, uniform grading and packing. Associations and fruit operators find it very difficult to get uniform grading done when the packing is done in individual packing houses by small growers. It is impossible to provide a system of inspection and a force large enough to keep continual watch over several hundred small growers. The community packing house is the logical method for uniform grading and standard packing. In addition to this it is a well-established fact that packing in community packing houses can be done at a much lower cost. Where the grower has five, ten, or possibly fifteen or twenty acres, it is difficult for him to provide himself with the necessary equipment, introduce efficiency methods and conveniences, which are necessary to keep the cost down to a minimum. If a grower has forty acres, turning out twenty cars or more a year, his business is large enough so he can keep down the cost by introducing the necessary system of efficiency and inspection to put out a uniform pack and standard grade, but where acreages are much less the community packing house seems to be the only solution for the problem of more perfect standardization, which is without doubt an absolute necessity for the future in marketing the fruit crop to the best advantage.

Apples on Cold Storage.—According to the United States Department of Agriculture bulletin issued April 7th, the amount of box apples on cold storage March 1, 1916, was 1,995,976; April 1st, 1,287,452, showing a reduction in March of about 700,000 boxes. With the present number of boxes on hand April 1st, it will take nearly two months, April and May, to clean out the present holding. As everybody knows, fresh vegetables and strawberries from the Southern States come on the market in April; it is therefore evident that the amount of box apples on storage the first of April is too large. It is also evident, after the 1915-16 experience, that a movement should be made to reduce the cold-storage holdings earlier and more rapidly. In reference to the combined holdings of barrels and boxes, expressed in barrels, on cold storage March 1, 1916, was 3,248,019; April 1, 1916, 2,017,512, or a reduction of about one million. At the rate of sales during the month of March it would take April and May to clean up the holdings, which again illustrates the fact that there are too many apples on cold storage, of both

barrels and boxes, the first of April, 1916, which makes it very evident that the holdings are held too long. Apples should have been moved earlier and more rapidly. The holdings of barrels and boxes, expressed in barrels, April 1, 1915, was 1,343,117; April 1, 1916, 1,932,085, or 43 $\frac{1}{10}$ per cent more than last year. This is further evidence of the fact that the apples were not moved early enough or fast enough this year in order to make a satisfactory closing season, or to make satisfactory prices. With the quantity of apples held this year it is evident a good many will suffer.

The Enforcement of Horticultural Laws.—The experience of Mr. J. W. Pomeroy on the "Enforcement of Horticultural Laws," which appears in this edition, is well worthy of every fruit-grower's attention. The complaint on the lack of enforcement is general. Many people blame the laws for being deficient, others blame the inspector for being negligent. Mr. Pomeroy's experience is not only interesting but valuable. There is no question about the correctness of his attitude, which is that fruitgrowers can be educated to the necessity of conforming to the laws, and that enforcement of the laws will be much easier and the laws more generally complied with. No matter what your views are on the subject of horticultural laws and inspection, you will find it worth while to read what Mr. Pomeroy has to say. It is every fruit-grower's duty not only to understand the laws but to comply with them. Every fruitgrower should understand the laws and obey them. He should do more than this,—if his neighbor is negligent he should endeavor to impress upon him the necessity of complying with the law, not only for his own interest but as a duty to his fellow orchardists. Without question if the right kind of educational work is indulged in by all the fruitgrowers who are anxious to do the right thing that much better results can be obtained in the way of having horticultural laws lived up to the letter.

By-Products.—It is time for the fruit-growers to begin to think about the large crop that is being generally reported in all districts this year. It is time for them to begin to think about what may happen. It is time for them to begin to prepare to take care of the surplus if the markets become glutted, as they probably will. Therefore the subject of by-products should now command the attention of the fruitgrowers. Consequently the growers should give immediate thought to the by-product business, canneries, evaporators, vinegar factories, cider plants, etc. Growers should not only make up their minds what is necessary to be done with the surplus, but before the surplus exists they should provide themselves with the facilities for taking care of it and saving it. Arrangements for such equipment, machinery, etc., that is necessary should be made early in order

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Elsewhere in this paper you will find factory advertisements of nationally known lines of orchard and farm implements handled in the Northwest by us and our agents.

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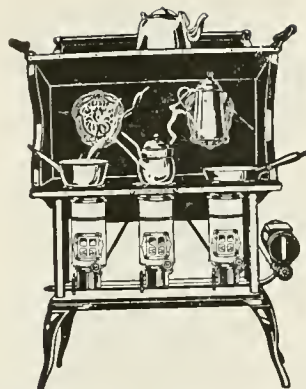
- 1 The Hurst Evaporator is built in units of $\frac{1}{2}$ ton capacity of green fruit in 24 hours. You can add one or more units any time without stopping the operation of the first unit.
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- 7 Italian Prunes can be evaporated in 14 hours—Apples in 2 hours—Loganberries in 12 hours.
- 8 Made in one size **only**.
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COMPANY**
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*For Best Results
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and a cleaner,
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2,000,000
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In 1, 2, 3 and 4-burner sizes, with or without oven. Also cabinet models with fireless cooking ovens.

to have the plants ready when the season arrives. As Captain Paul H. Weyrauch has given the matter a great deal of investigation, having served on the By-Products Committee, in addition to being manager of one of the largest orchards in the State of Washington, his ideas are certainly valuable, consequently it seems wise to urge every fruitgrower to read what Captain Weyrauch has to say in his article on this subject appearing elsewhere in this edition. Make up your mind what you are going to do and then do it.

Small Fruits.—A great deal has been said upon the subject of diversity, pro and con. Many are advocating that the fruitgrower engage in the dairy business in connection with orcharding. Others are suggesting they raise hogs. Still others go even further and advise the fruitgrower to become a general farmer. Professor C. I. Lewis of Corvallis, who is recognized as one of the most practical horticulturists of the Northwest, had an article in "Better Fruit" that expressed his views, which appeared in the February edition, in which he advocated the fruitgrower should engage in diversity, advocating primary diversity in the raising of fruits, including small fruits. There are many fruitgrowers whose land is suitable for the production of small fruits. A moderate acreage in small fruits will be very helpful in equalizing the income of the fruitgrower at different times of the year and in different seasons, and it also helps to equalize the help problem. Mr. J. C. Stuart has had many years' experience in the growing of all kinds of small fruits. His valuable suggestions and ideas are incorporated in an article which appears for the benefit of the fruitgrowers in this edition.

Fire Extinguishers.—A little experience on the part of the editor this winter affords a valuable suggestion for every fruitgrower and farmer. One of the men working for the editor in attempting to thaw out the pipes in the tank house with a blow torch set the tank house on fire. Some time ago the editor put in two fire extinguishers. With the aid of these the fire was extinguished, saving the tank house from destruction. A number of fire extinguishers are on the market now at very reasonable prices. Every fruitgrower and farmer should have one or two on hand. A good fire extinguisher, used at the right moment before the fire gets much headway, may save the house or barn from burning and prevent a serious loss.

The Retailer's Profit.—"Better Fruit" has continuously and consistently maintained for many years that the retailer's profit in apples is too high. It is an established fact that many retailers charge an exorbitant profit. It is well known that in some cities the retailers as a class make unreasonable profits. Whenever a retailer makes an

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unreasonable profit it comes out of the consumers' dollar and means just that much less money for the fruitgrower. While the average per cent of the consumer's dollar obtained by the orange grower in 1915 was 40% per cent, when the retail margin was extremely high, the grower received only 19% per cent of the consumer's dollar. There is a big difference between the fruitgrower getting 40% per cent of the consumer's dollar and getting 19% per cent of the consumer's dollar—most all this difference being absorbed by the retailer through charging an exorbitant profit. The average retailer's profit was 24% per cent for 1915. The profit of the exorbitant retail dealer in 1915 was 46% per cent.

Stock in Connection With the Orchard.—A great many fruitgrowers are going into the dairy business in a small way. In order to obtain the best results in the way of dairy products the silo has become considered a necessity. The small orchardist who wants to keep a few cows, grow his own hay, with the use of a silo can provide the best possible feed,—feed that will give the best results in the way of milk and butter fat. By the use of a small silo, which can be had at a very moderate figure, better profits can be made. Fruitgrowers who are engaged in the dairy business, or those who expect to engage in it, will find it worth while to investigate the silo.

Fire Blight.—Along about the blossoming time, and from then on for a few weeks, the most dreaded disease the orchardist has to contend with—fire blight—becomes active. It is something every fruitgrower should know about. It is a disease that every fruitgrower should know how to control. If you are not informed and not familiar with the disease it will be mighty good judgment on your part to consult your inspector, some horticulturist or some fruitgrower who has had experience. In this edition is an article by Professor F. D. Heald of the Experiment Station, Pullman, Washington, entitled "Some New Facts Concerning Fire Blight." Professor Heald is recognized as an authority on this subject, having had many years' experience, and therefore his article is very valuable and one that should be read by every fruitgrower in any locality where they have had fire blight.

Advertising the Apple.—The California Fruit Growers' Exchange spent \$350,000 on a \$30,000,000 crop, which is 0.5 per cent of the consumer's dollar, the consumer's purchasing price being \$5.43, would mean that the orange growers .02715 cent per box in advertising oranges, which will give the apple growers something of an idea of what is necessary for him to spend to carry on a national advertising campaign.

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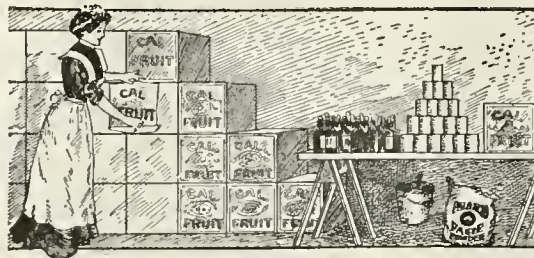
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Centralization of Packing

By S. V. Beckwith, General Manager Rogue River Fruit and Produce Association, Medford, Oregon

MY subject covers two features that are vital to the success of deciduous fruit growing in the Pacific Northwest. First, the physical handling of the fruit; second, standardization of pack. To successfully grow good fruit, to cultivate, to prune, to combat scale, codling moth, blight, scab, Baldwin spot, water-core, and the other diseases that deciduous fruit is heir to; to produce good crops of good fruit every year—these are problems which call, in my opinion, for a high degree of intelligence and eternal vigilance. On the other hand, to successfully distribute and market the fruit when grown and produce good prices year after year, is another equally im-

portant and equally difficult problem demanding the best energies of the highest trained men in that specialty. But the production of good fruit and the intelligent marketing of it will not avail if the assembling and packing of the fruit is poorly done, resulting in an unattractive package and physical damage to the fruit itself.

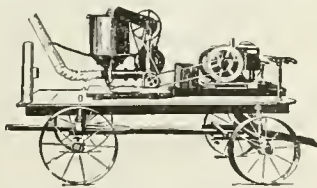
The Rogue River Fruit and Produce Association has just completed its sixth consecutive season as a co-operative deciduous fruitgrowers' association. In that period it has acquired not less than five different packing and warehouses as five widely-separated points in the Rogue River district, each packing house being located upon the railroad and having its own sidetrack. The most recent of these houses was acquired no less than three years ago. In the early history of our organization we packed the growers' fruit at each one of these five warehouses, having crews working in all of them at the same time, and in addition to this perhaps fifteen or twenty of the larger growers ran their own packing houses, at which their own fruit was packed under our supervision. This imposed upon the management a nearly impossible task—that of supervising and inspecting all of these packs so thoroughly and so successfully as to insure standardization and careful handling at all times. We did our best, but were distinctly not satisfied with the results. Another bad feature of this method was apparent in the handling of the early pears such as Bartletts and Howells. We found it physically impossible to clean up each one of the packing houses every night, and to pack out during the day every pear, whether first, second or third grade, that had been brought in the day before. Then again, even the packed Bartletts would of necessity lie around occasionally for twenty-four hours or longer before being loaded into an iced car. There

might be, for instance, only a half car packed and ready to roll, which would have to wait until the next day without refrigeration, for enough fruit to complete the car. I do not mean to say that this was a frequent occurrence, but in spite of our best efforts it would happen once or twice during a season.

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truck as an assembler of fruit. We tried this out in a small way during that season, hauling some pears and a considerable quantity of Newtown apples, loose in packing boxes, to our cold-storage plant in Medford. The experiment was so successful that we laid our plans in the winter of 1914-15 for complete centralization of packing at our cold-storage plant. We transformed our second story, by inserting plenty of windows, into an ideal packing room where we could, if need be, operate a crew of 100 packers. We built a conveyor at one end of our building, by the use of which one man could unload the fruit from the truck, and it would be carried to the second story, there to be received by roustabouts and distributed for packing.

Not being financially able to purchase our own trucks, we made early negotiations with all of the available trucks in our district, and arranged with them to haul the growers' fruit upon a regular tariff, based on the length of the haul and condition of roads. We concentrated at our cold-storage plant all packing supplies, gathering them in from our outlying houses. We offered to pack for the grower, furnishing all labor and materials, for the sum of twenty-five cents per box for pears and twenty-eight and one-half cents per box for apples, plus whatever the auto haul might be. We have permitted some growers with short hauls over exceptionally good roads to haul their own fruit, but wherever the haul was long or the road rough, we have insisted upon the use of the auto truck. Our largest truck has a capacity of two hundred and fifty packing boxes of loose fruit. We have hauled crops of both apples and pears a distance in some instances of fourteen miles. The bruising to the fruit has been negligible. In fact it is our experience that a good auto truck loaded to capacity rides as easily as a five-thousand-dollar touring car. Our operations began the first week in August with Bartlett pears and have been kept up continuously until the 13th of November, when our packing was completed. The hauling of the Bartlett and Howell pears, which are picked in extremely hot weather, was all done at night. The grower would advise us at the end of his picking day what he had to be called for. This he piled at some convenient place in his orchard where the auto truck was able to go. At any time between 10 o'clock in the evening and 3 o'clock in the morning the truck called for this fruit, and it was delivered at our central house during the cool hours of the night, received there by a night crew whose duty it was to segregate it according to growers' names, check up carefully the number of boxes received, place in each box a card bearing the name of the grower and stack it in front of the packing tables for the next day's operations. The packing crew came on at 8 o'clock, and in every instance cleaned up all of the fruit set before them for that day. As soon as

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the fruit was packed it was labeled and sent downstairs by gravity, either into an ice car or if necessary into our cool rooms, where it would be held twenty-four or forty-eight hours, or two weeks if advisable, under ideal conditions. With later varieties of pears and apples the necessity for night hauling was removed, although we continued to haul at night as much as possible because of the convenience of so doing. Thus we have had one crew

varying in size according to the amount of fruit to be packed, in constant operation since the first week in August. There has been one head packer over this crew, whose constant and only duty has been to supervise and inspect the pack. The growers have not purchased from us a single box or a single sheet of paper, and we know where every particle of material has gone and exactly what, if any, our waste has been. Perhaps fortunately for us the

crop of our district has this year been a light one and we have been permitted to work out this experiment under conditions which did not result in tremendous crowding. We have made mistakes, but no vital ones. We have gained the experience of a full season's work, and can most certainly correct these mistakes another season and improve in many minor details upon the general method. The improvement in the physical handling of the fruit, both from the standpoint of bruising and of keeping the fruit in proper temperatures, and the improvement in our grading and general standardization of pack and mechanical excellence of it has been very marked. One large foreign buyer, after careful inspection of our methods and our packed fruit, characterized the pack as the best he had seen. We are peculiarly fortunate in our district in having on the whole very good roads and comparatively easy hauls. Our association is also peculiarly fortunate in having cold-storage facilities which are available immediately after the fruit is packed.

The possibilities of this system seem to me very far reaching. Our district, and I believe every district in the Northwest, must come sooner or later to a co-operative use of our waste material. With all of our culls or otherwise unpackable fruit collected in one place, the day is not far distant when we may be able to install as an adjunct to our packing and cold-storage plant an up-to-date cannery and apple-juice factory. This will do away with the great problem of what to do with our culls, and while we all hope for the time when the percentage of culls shall be reduced to a negligible quantity, we all know full well that there never will be a year when a large fresh-fruit packing plant, such as ours is bound to be, will not have an abundance of waste material that can be advantageously turned into some by-product.

In conclusion let me say that centralization of packing has, in my opinion, come to stay; that it will do more, especially in connection with cold-storage facilities, toward the proper handling of our fruit and the proper standardization of our pack and improved deliveries in all the markets of the world, than any single plan or idea that has ever been tried out by the deciduous fruitgrowers of the Northwest.

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Some New Facts Concerning Fire Blight

By F. D. Heald, Professor of Plant Pathology and Plant Pathologist in the Experiment Station, Washington State College, Pullman, Washington

FIRE BLIGHT of apple, pear, quince and other hosts occupies a unique position among plant diseases since it is the first plant trouble that was proved to be due to bacteria. Although the disease had been known during the early history of the United States it was not until about 1880 that the bacterial origin of the trouble was definitely established by Dr. T. J. Burrill, then professor of botany at the University of Illinois. As a pioneer in plant pathology his name is inseparably connected with the early history of fire blight. His discovery, made thirty-five years ago, marked the beginning of real progress in our knowledge of the disease. A little later Mr. J. C. Arthur, in a New York Agricultural Experiment Station report, extended the work of Burrill and established the bacterial character of the disease upon a firmer basis. Since that time our knowledge concerning the etiology of the disease and methods for its control has gradually increased, and a voluminous literature has accumulated. It would neither be possible nor opportune to consider the historical development of our knowledge in detail, but I wish to point out a few of the prominent and important steps along the pathway of our progress.

In 1895 M. B. Waite of the United States Department of Agriculture showed the relation of bees to the spread of blight, proving that the bacteria multiply very rapidly in the nectar of the flowers and are then carried from flower to flower by the insect visitors. The part played by other insects in the dissemination of the disease has been studied more in detail by other investigators during recent years. In 1906 H. H. Whetzel of Cornell University Experiment Station published his work on the relation of the blight bacteria to cankers in apple trees, showing that these organisms were capable of producing cankers upon the larger limbs and trunk of the tree. The way in which the blight bacteria migrate through the tissues of the host plant had long been a disputed question, so the establishment of the fact by Freda M. Bachmann that they travel in the intercellular spaces, rather than by penetration of cells, must be considered of fundamental importance.

If we should sum up our knowledge concerning the way in which fire blight manifests itself we should find a general agreement, the four following ways being recognized according to the parts invaded: (1) Blossom blight, due to original infection through the nectaries by bacteria disseminated by in-

sects which visit the flowers in search of food. (2) Twig blight, due to infection through wounds made by insects or other agents in the succulent tissues of terminal shoots. (3) Fruit blight, due to primary infections through some wound or migration of the bacteria up the pedicel into the pulp of the fruit. (4) Cankers or body blight, due to migration of the bacillus down fruit spurs, from twigs or watersprouts showing twig blight or by primary infection through wounds.

I am going to speak briefly concerning a certain phase of fruit blight of apples and the occurrence of leaf invasions as a new phase of the disease which has only recently been established by the investigations of the writer.

Fire blight lesions of a very characteristic type may be produced upon developing fruits of the apple. If a young fruit is invaded through the pedicel it will be entirely destroyed, but if the infections are primary through the skin of the fruit the behavior may be entirely different. About the middle of June apples from some orchards infested with blight showed definite circumscribed spots, circular in outline and varying in diameter from three-eighths to one-half inch or more. The affected spots were dark brown or sometimes nearly coal black,

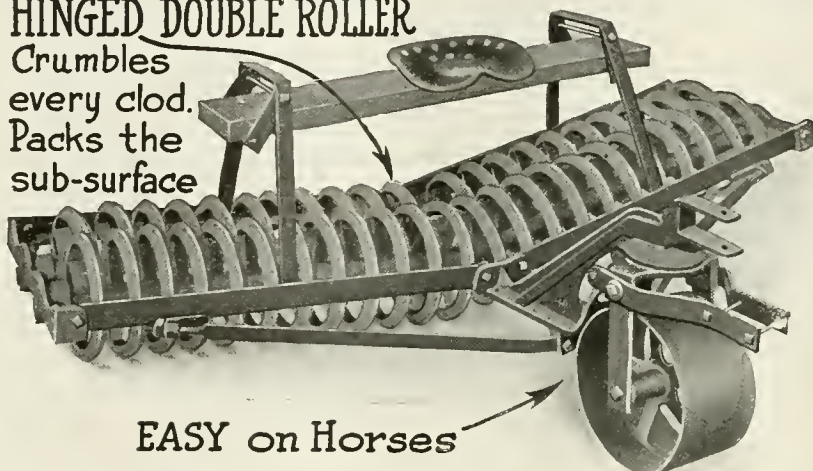
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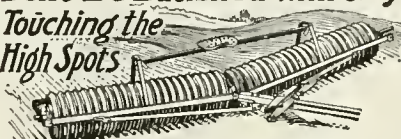
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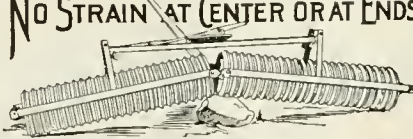


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somewhat depressed, and frequently surrounded by a border of red. Study showed that many of these lesions did not extend in area even when the fruits were exposed to the most favorable conditions for the development of bacteria and cultures from such showed that the bacteria were dead. In some cases there would be an extension of the lesion under favorable conditions, and cultures made from such specimens always gave the organism of blight. In all lesions of the type described the presence of bacteria could be established by microscopic examination. The affected tissue was always teeming with myriads of blight bacteria, either dead or alive. A small fragment of the brown tissue from one of these lesions when placed in a drop of water would invariably show a pronounced turbidity or milkyiness due to the abundance of the bacteria which were scattered throughout the drop. This method constitutes an easy way of verifying the presence of the blight bacteria without the use of a microscope. This behavior of the blight bacteria in the fruit of the apple is in agreement with their behavior in blossom or twig infections. It is known

that the bacteria in fruit spurs and twig blight cease to grow and die out in many cases by midsummer. In the apple the bacteria develop for a time, producing lesions of varying size, but finally their growth ceases and they die in a high per cent of the infections, thus producing the definite circumscribed lesions which have been described. Whether insect punctures or wounds of some other kind are necessary for these fruit infections is an open question at the present time. It is undoubtedly true that some of these lesions originate from insect punctures, but it is worthy of note that no break of the skin can be found in many of these infections. It will require further work to demonstrate this point, but the writer is of the opinion that stomatal or lenticel invasions are possible.

Up to the time of the work published by the writer, no investigators had admitted the possibility of leaf invasions by the fire blight organism, *Bacillus amylovorus*. The opinions held by various scientists are outlined in the bulletin referred to and will not be repeated. Suffice it to say that a statement made by J. C. Arthur in re-

porting on his early investigations of blight has not been disputed by later workers. He wrote as follows: "Bacteria cannot be found swarming in the leaves as in the bark and wood; the conditions do not seem favorable for their development." As a result of preliminary observations and investigations carried out during the past season it can be definitely stated that leaf invasions by the blight organism are of frequent occurrence, and that the bacteria can be found in enormous numbers in the veins and mesophyll of the invaded portions. In connection with this statement it may be of interest to read a letter received from Dr. Burrill:

URBANA, ILLINOIS, November 3, 1915.

MY DEAR PROFESSOR HEALD:

I hold in my hand your "Preliminary Note on Leaf Invasions by *Bacillus Amylovorus*," Bulletin No. 125, and wish to say that I feel confident from my own observations that you are correct. This is, however, exactly opposite from my earlier observations and investigations. I remember I spread the viscid exudate from the twigs over the leaves above and below without results, and these tests doubtless served afterwards to prevent reference of leaf spots such as you describe to this cause. I have never seen the sticky substance exuding from the leaves, but have seen leaves which had all the characteristics of being infected. I do not think I ever tried to find the organisms in leaves by microscopic methods.

Your observations and experiments are important, and may lead to something greatly worth while.

Very truly yours, F. J. BURRILL.

Continued in next issue

**Pansy Plants, Geraniums
Dahlias, Gladiolus
Bedding and
Vegetable Plants**

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Short Paragraphs by the Editor

Take pride in your pack.

* * *

Pack according to grading rules.

* * *

Suspicion is generally due to ignorance.

* * *

Anybody can imitate; it takes brains to be original.

* * *

An Extra Fancy label won't make Extra Fancy out of C grade.

* * *

A lack of preparedness in marketing means Red Ink. A red flag makes a bull fighting mad. Red Ink makes a fruit-grower madder and—busted.

* * *

"Nothing succeeds like success." Too much success makes some men foolish.

* * *

Beauty is only skin deep, so is color on an apple,—it doesn't make the flavor.

* * *

If you don't square the contents of the box with the label you will not get the price.

* * *

You can win on merit, but not on deceit. The inspector is your friend—not your enemy.

Knight Joins du Pont Organization

Thomas M. Knight has resigned as editor of the Practical Farmer, Philadelphia, to join the Agricultural Division of E. I. du Pont de Nemours & Company. Mr. Knight will aid the company in the extension of the use of dynamite in agriculture. He is a practical farmer, has an expert knowledge of fertilizers and is a popular lecturer on agricultural topics. Mr. Knight will collaborate with the company's agronomist, Dr. J. H. Squires, in field tests and lectures at agricultural colleges, and meetings of agricultural societies.

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"We made a careful oil test covering eight months, using two eastern oils, and a western oil made from asphalt-base crude," said C. L. Ross, manager of the Pacific Car Co., of Tacoma, agents for the Packard. "In spite of the fact that the Packard carrying the western oil was driven 3000 miles more than the other two cars, it showed less wear on cylinder walls, rings, pistons and motor bearings, with practically no carbon. On the other hand, both of the cars carrying eastern oil had large carbon deposits. There's no question in my mind about the superior quality of western oil, especially in the present-day high-speed motors with their close-fitting pistons. Freedom from piston drag, and freedom from carbon are highly essential in the operation of these motors, and western oil gives just the results needed."



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Silo Important for Fruit Grower-Stock Raiser

By Geo. North, Portland, Oregon

THE keeping of live stock on the farm where there is but a small amount of land, a few years ago was regarded as an impossibility, is now beginning to be viewed in an entirely different light. There are yet, however, any number of people, while well informed in regard to the live-stock business as it was years ago, when range was plentiful, who are not familiar with the silo and the results of silage feeding, giving advice that is of no practical benefit to the men with a small acreage. Such men, not silo wise, even in these times of high prices of beef are finding it difficult to make the old-time profits. It is no exaggeration to state that some of the most profit-

able results in dairying are being experienced among the fruitgrowers who farm intensively, and in the nature of things, keep small herds, and, through the silo, produce their feed at little expense and at a minimum amount of labor.

The silo has fully solved the problem of keeping a moderate number of head of stock on a small amount of land. With a good silo, it is not only possible but practical as well as profitable for the orchardist to keep from a small to a large dairy herd, depending upon the size of the tract of land. The ability of the orchardist, through his silo, to supply his herd with a green, succulent feed at the time of year when the range

man's pasture begins to dry up and thus keep up the milk flow enables him to produce with a smaller herd as much butter fat as the man with a greater herd and no silo produces. Land not at present utilized for the growing of any crop will produce an astonishing amount of silage. Orchardists already having the investment in this land are, therefore, able to produce this crop without any extra investment. Even the labor is little, if any, greater than in keeping it free from weeds. The valuable fertilizer obtained is in itself a source of profit. The monthly or semi-monthly income derived from the sale of the milk or cream helps along wonderfully, and those starting in the dairy business in a small way will soon find, besides these items, the increase in their herd amounting to a very substantial sum.

The silo is a permanent institution and has come to stay. In starting to use silage as a feed, the thing of most importance is to start right. For the benefit of those who have never had any experience in feeding silage, a brief outline is here given of the most important things to be done in order to avoid several very common mistakes made by most beginners. The first thing to decide on is what kind of silo to erect. As a silo is exposed to the hot moisture when it is full and the hot sun and winds when it is empty, these cause the wood to shrink, swell and warp. But as the silo walls must be straight and true and must remain so from year to year, it is evident that the very best and most substantially constructed silo is the most economical and will bring the greatest returns on the investment. There are many types of silos on the market. Besides this, there is a vast number of so-called Silo Experts who are ready to instruct you how to build a silo for a small amount of money. Experience has proven that these cheap, home-made silos are a failure, as they will last only a year or two. They will twist out of shape and finally collapse entirely, when the farmer will be out not only the cost of the silo, but from

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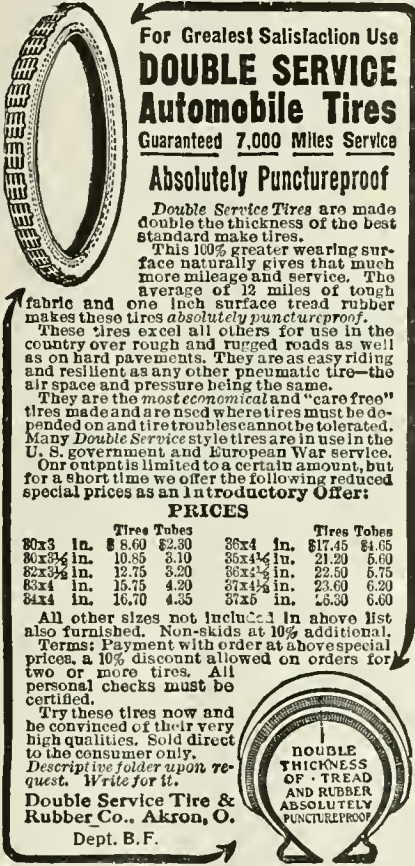
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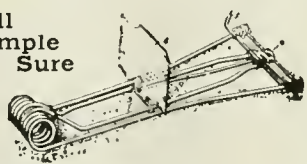
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\$300 to \$500 worth of feed besides, so that the greatest mistake that could be made would be to take a chance of losing this amount of valuable feed in order to save from \$30 to \$50 on the first cost of the silo. Besides this, these unsightly cheap silos are a continual eyesore on your place. They detract from its appearance. Slightly structures add to the value of your place.

The next to consider is what to fill your silo with. When to fill it. How to fill it. It is generally conceded that corn makes the ideal ensilage, but as that is a fall crop you should find some suitable crop for filling the silo in early summer. It has been found that a silo is needed fully as much in late summer and early fall as it is in winter, owing to the fact that pastures dry up until they are as bare as the street during the late summer months. The best summer crop for silage is, no doubt, vetch mixed with oats, but in localities where vetch cannot be grown successfully, other crops such as clover or alfalfa can be put into the silo with good results. This summer silage can be fed out, or as much of it as is needed, and then filled right on top with corn for winter use. Since the summer silage is frequently not all fed out before the corn is ready to put in, care should be taken to erect a silo large enough to give extra storage space in time of plenty, against a time of shortage. This extra storage space can usually be obtained by getting a silo of greater height than actual size of herd requires. The silo should be just as large in diameter as is possible to feed from one and one-half to two inches per day from the entire surface with the amount of stock on the farm at the present time, and then fully twice as high as the diameter. This will give about as much extra storage space as one-third of the capacity of the silo. This will also enable you to increase the herd without the expense of erecting another silo, which would also necessitate the cost and trouble of maintaining two silos as against one, if the first one put up is of the proper size.

Another common mistake made, and one that contributes fully as much to the cause of bad silage as an inferior silo, is putting the stuff into the silo too green. The idea prevails among most farmers that this is a green feed, so the greener the better. This is a serious mistake, for when silage is put up too green, too much acetic acid forms from the sap in the plant, which causes the bad odors and the sour ensilage so often met with. Any plant put into the silo should be allowed to stand until it has reached its full growth and has fairly started to ripen or dry up. Some crops, such as clover, and particularly alfalfa, should be cut and allowed to lie in the swath for a day or so (depending on the weather) to get rid of the sap. If necessary, then add enough water when filling the silo to give the proper amount of moisture. If this is done, and the silage is cut fine and well tramped into



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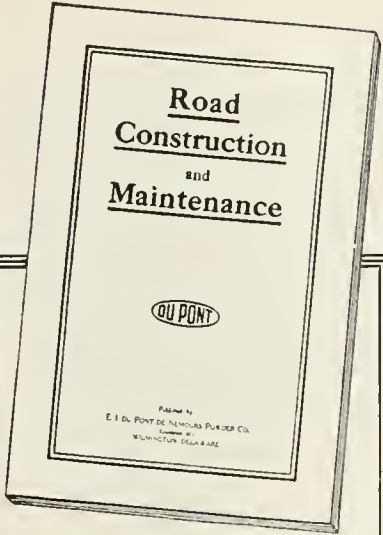
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a good silo, there can be no question of good silage.

Seven or eight acres of good vetch and oats will make one hundred tons of silage which is reasonably worth \$5.00 per ton to any one who has stock to feed. This, at a cost of perhaps \$65.00 in time and labor, leaves a sufficient profit on one filling to more than pay for the silo. Add to this the profit of the second filling the same year, with corn, and add the value of manure as a fertilizer, and it can readily be seen that any one with stock cannot afford to be without a silo. Those who have a farm or orchard without stock should get stock in order to make the profits that are possible with the intelligent use of a silo.

The Growing of Small Fruits

By C. J. Stuart, Monroe, Washington

FOR the past twenty years the writer has been closely identified with the shipping and growing of berries in Western Washington. He has seen during that period shipments of berries to points east of the mountains grow from a few hundred cases annually to almost an equal number of carloads.

To begin with, any well-drained soil in Western Washington, or Oregon as well, that will raise a good crop of potatoes successfully, will grow berries with proper care and cultivation. A well-planned berry farm, say of twenty acres, should have all the desirable varieties of berries common to Western Washington, and should plan to plant those kinds that ripen at different times covering a season extending from May to October; such a plant would enable the owner to distribute his labor over a longer period, have a less number of pickers, and a better class, by giving them longer jobs, besides lengthening his shipping season, and giving his customers the different varieties.

On this farm of twenty acres I would plant one acre of Champion of Oregon gooseberries, in rows and hills five feet apart; this gooseberry is the only variety that is a reliable, regular, and full bearing mildew proof berry that I have ever found suitable for this climate. Spray them annually in March with lime-sulphur, and again when the blossoms are fading with arsenate of lead, thereby insuring a wormless berry and free of mildew.

The next planting should be one acre of Victorian currants. Plant them the same distance apart and spray as gooseberries; drive a stake about four feet long and three inches square at each hill and tie your plants thereto; this will give them an upright growth, and facilitate spraying and picking. The Victorian is a late blossomer, and in consequence misses the late frosts, is a heavy bearer as well as a sure one, and the fruit will hang two or three weeks on the bushes after ripening, and does not shell when being picked as other varieties do.

Plant one acre of strawberries. I plant the Marshall, but believe the Klondike possibly better. It ripens better at

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the blossom end, but does not equal the Marshall in yielding; plant in rows three feet eight inches; in hills sixteen inches. I find but little profit in growing strawberries, but must have them to fill orders.

Six acres of Cuthbert raspberries. Plant in rows eight feet apart, hills four feet apart; set posts every twenty feet, nailing a cross piece, say a 2x4 fourteen inches long, at the top of the post, four feet from the ground, stringing two No. 12 galvanized wires one inch from the ends of each cross piece; one wire of which is to be used for training the bearing canes on, and the other to hold in an upright position the new growth. Weave the canes on the east wire, which will enable the sun to dry the dew on the canes and allow you to commence the picking earlier in the morning.

Follow with four acres of Snyder, Texas, or Eldorado blackberry, provided you can get plants from new fields not affected with the blight, or fungus diseases; plant, wire and handle same as red raspberry.

Two acres of Cumberland blackcap raspberries. Plant and handle same as

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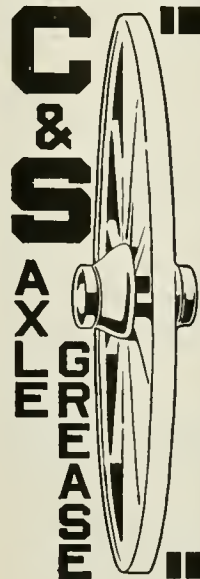
raspberries and blackberries. Blackcap raspberries are an expensive crop to grow, but they are a delicious and attractive berry, are good shippers, and bring prices in excess of any other berry.

Two acres of dewberries. Plant in rows eight feet, and in hills twelve feet apart; posts twelve feet apart; stretch two wires on cross pieces, nailed on posts, same as blackberries, putting cedar or other light wood slats 1x2 inches, fifteen inches long, fastening one end to a wire with poultry staples. This will enable the slats to be adjustable when removing the old canes, and putting up the new; slats should be placed about two feet apart; two additional wires should be placed on cross pieces, nailed to posts some two feet from the ground, with the usual slats; this lower wire, to allow the new canes

to be trained thereon, keeping them off the ground, and free from injury of the feet of the pickers.

Then plant one acre each of Logan and Phenomenal berries, seven or eight feet apart in rows, six feet in hills, posts twenty feet apart; nail one No. 12 galvanized wire on the side of the posts five feet from the ground, another fourteen inches below, and loop the bearing vines over the two wires, allowing the new canes to grow on the ground; with a little training they can be kept bunched together under the wires, and out of the way of the pickers' feet. This manner of treating Loganberries is new to Washington, and was first used in California. I shall adopt the plan in my fields in future planting.

We now have but one acre out of the twenty left; this plant to sour or pie cherries, Montmorency preferred. There



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is a growing demand for them, both in our nearby and distant markets. They should be planted about twenty feet apart, and do not require much pruning or spraying; are almost immune from gummosis.

Such a farm would give the grower almost steady work during the entire year, and by rushing the work, instead of letting it rush you, but little help will be necessary, other than during the picking season.

Berries should have shallow and frequent cultivation during the growing season, keeping down the weeds and grass, and conserving the moisture; in other than strawberries, two hoeings during a season would ordinarily answer; stop your cultivation after the berries have ripened, and allow weeds and grass to grow in the rows, to serve as a cover crop; over cultivation or rather continuous cultivation is injurious to the land.

Just as soon as you have finished picking a field of berries, remove the old canes and burn them, thereby removing the possibility of your new canes being infected with fungus diseases from the old canes.

I find on close observation that the profitable life of berries is shorter than generally supposed. My record shows that currants and gooseberries cease to be profitable after bearing seven crops; raspberries six; blackberries and black-cap raspberries five; dewberries are an exception, however. They seem to have a perpetual useful life.

The production of berries on the Pacific Coast seems to have grown faster than the consuming population in our Eastern markets, and in consequence prices are being cheapened, and economy and vigilance must be practiced.

With a suitable location near a good association and cannery I would have no hesitation in recommending the planting of a berry farm, such as described above; but as in all other lines of business, capital and experience are two needful things to insure success.

Spraying Suggestions

Spraying suggestions for use in the Hood River Valley, to kill leaf roller, aphid eggs, San Jose scale, blister mite, etc., and for the control of fungus scab, mildew and codling moth on apple trees:

1. Late dormant spray, to kill leaf roller eggs and aphid eggs. Dormant soluble oil or miscible oil No. 1 diluted and mixed with water at the rate of twelve gallons for each 200-gallon tank of spray. Thoroughly cover every part of every tree, especially the terminal buds, fruit spurs and smaller limbs. Hold the nozzles close to the limbs and buds and use machines giving high pressure so that the spray will be driven against the surface of the tree with the greatest force. Use large chamber type mist nozzles with small opening to produce a "mist" or "covering" spray.

2. Early pink spray, for scab control. Use 33-degree Beaume (25 per cent sulphur in solution) lime and sulphur so-

lution mixed with water at the rate of eight gallons for each 200-gallon tank of spray, covering the entire surface of the tree, leaf buds and expanding fruit buds thoroughly.

3. Calyx spray, for scab, mildew and codling moth control. Use the following combination: Lime-sulphur solution, 4 gallons; atomic sulphur, 12 pounds; arsenate lead paste, 8 pounds;

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water to make 200 gallons. In mixing this combination, put the lime and sulphur solution into the tank first and then with the agitator running, fill the tank about one-half full of water, then put in twelve pounds of atomic sulphur which has been previously diluted in two or three times its volume of water and when the tank is nearly filled, add the arsenate of lead paste the last thing before spraying. It is important that the atomic sulphur be added at this time in all orchards infected with mildew or where mildew is likely to cause any trouble. (All fruit growers who expect to use atomic sulphur at any time during the season should begin at time of calyx spray and combine it with arsenate of lead and lime-sulphur solution in order to start stimulation at this time and prevent over stimulation and sulphur injury later in the season.)

4. Ten-day spray. About ten days after the petals fall an additional application for scab control should be applied. Weather conditions will govern, to some extent, the material to be used. If cool, rainy weather prevails at this time, use lime-sulphur solution diluted at the rate of four gallons for each 200-gallon tank of spray. If the weather is reasonably clear and warm, use atomic sulphur at the rate of twenty-four pounds for each 200-gallon tank of spray, as this material is less likely to injure the fruit and foliage than lime-sulphur solution under these conditions.

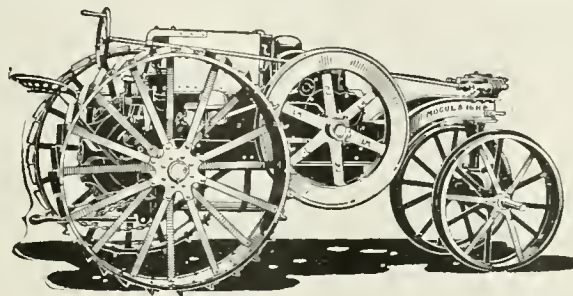
5. Thirty-day spray. Use the following combination: Atomic sulphur, 24 pounds; arsenate lead paste, 8 pounds; water to make 200 gallons. This is the second spray for codling moth control, the fourth spray for scab control and the final spray, under normal conditions, for mildew control. (If very hot weather prevails at this time, use twenty pounds of atomic sulphur instead of twenty-four pounds for each 200-gallon tank.)

5a. If cool rainy weather prevails between June 10 and 20 make an additional scab spray, using atomic sulphur ten pounds to 100 gallons of water.

6. Third codling-moth spray. This should usually be applied in early August. Use arsenate of lead paste at the rate of eight pounds for each 200-gallon tank of spray. Either atomic sulphur twenty pounds to 200 gallons of water for scab control, or Bordeaux mixture paste six and a half pounds to 100 gallons of water, or Bordeaux home made 4-4-50, may be combined with the arsenate of lead at this time as further protection against scab and anthracnose development. Properly balanced Bordeaux mixture is safe to use on most varieties of apples at this time, and in all orchards where anthracnose is likely to appear, Bordeaux mixture should be used at this time in addition to the early fall application recommended for the control of this disease. Too much emphasis cannot be put on the necessity for thoroughness and the proper timing of this work in every detail. Fruit growers know by this time what to expect by attempting economy in omitting one or more of these sprays

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AT the present prices of gasoline and kerosene, no farmer can afford to use a gasoline tractor. Gasoline averages now over 100 per cent higher in price than kerosene and is likely to go higher rather than lower, in the opinions of men who know the oil business.

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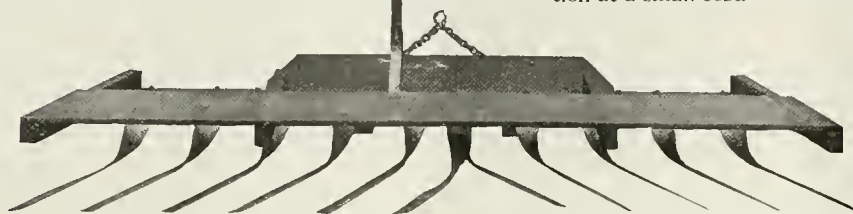
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depends largely on the way he cares for his orchard. Unless it is well cultivated he can not hope for good results.

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or by delaying the application of same. While the sprayings recommended above will cost something, the amount is insignificant compared with the difference in the price of scabby and of clean fruit. Furthermore, it must be realized that every year will make it more difficult to sell infected fruit at any price. In fact, this will be very largely prohibited the coming year. Another point which cannot be too strongly emphasized is that scab grows and develops much faster during cold damp or wet seasons than it does in hot dry weather. Furthermore, if rainfall is more or less general during the spring months, April and May, the spraying must be even more carefully done and repeated more frequently. All spraying followed by rain within twenty-four hours, should be repeated just as soon as possible. Furthermore, the spray cannot be expected to adhere or stick and give its greatest efficiency if put on wet trees.—S. W. Foster, Entomologist and Manager Insecticide Department, General Chemical Co., San Francisco Office.

The Outlook for the Apricot

The world's production of the apricot is limited. It is not grown extensively in the United States except in California. It is an early bloomer and cannot be successfully grown where spring frosts are common or severe.

It is particular as to soil, a rich sandy loam well drained being best suited to its needs.

Both trees and fruits are very subject to a disease commonly known as shot-hole fungus, for which an entirely successful remedy has yet to be found.

The apricot is fairly popular eaten fresh, is very good canned, and makes one of our best dried products. It possesses anti-scorbutic properties of great and recognized value. The dried apricot is a popular, cheap, nutritious, palatable and valuable food.

Owing to climatic and soil limitations it is not possible that apricot growing will be as greatly overdone as is the case with the peach. The short ripening season, coupled with difficulty of securing large supplies of labor for a few days at reasonable cost, will prevent large plantings anywhere; ravages of shot-hole fungus are likely to damage the crops of all except the most careful and intelligent growers—hence the danger of heavy overproduction is reduced to a minimum.

Clean, well-dried apricots, packed in small and sanitary containers can now be sold at a reasonable price, delivered by express at the doors of consumers all over the United States.

Judicious expenditure of a reasonable sum of money for advertising in the best home journals and magazines should and will create a demand that would take our entire product and then call for more.

Who is going to do it? The dealer or the grower? One or the other must. When this is done the apricot will need no one to foretell its future. It will speak for itself.—F. B. McKeon.

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—why, Prince Albert hits the universal taste;

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—why, it can't parch your throat—

All that is answered by the little *message-to-you* on the reverse side of every Prince Albert topky red bag, tidy red tin and humidor, which reads—

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discovers the
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the national joy smoke

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meets the best wishes of your pipe or cigarette makin's appetite as though it was made for *your* tongue and taste! Makes you forget you ever had tobacco troubles, it's so cheerful and chummy; and so cool and refreshingly good and satisfying!

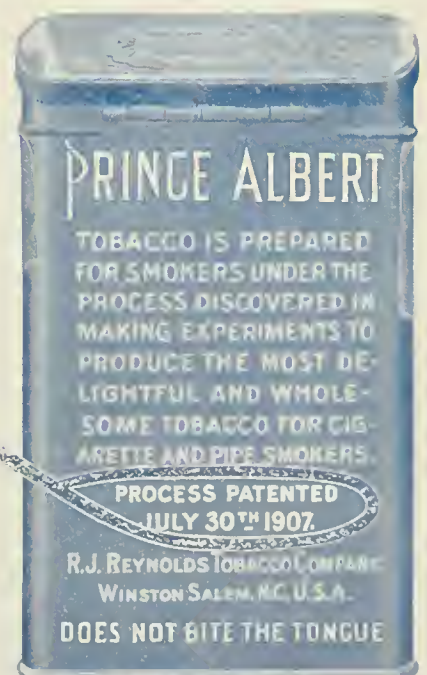
You'll get mighty friendly with Prince Albert because it can't bite your tongue or parch your throat! And, when you know it better, you'll realize that P. A. opens up the a. m. wide and sunny and helps close up the night in peace and content! And it keeps things top-notch-prime all-day-long!

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BETTER FRUIT

VOLUME X

JUNE, 1916

NUMBER 12



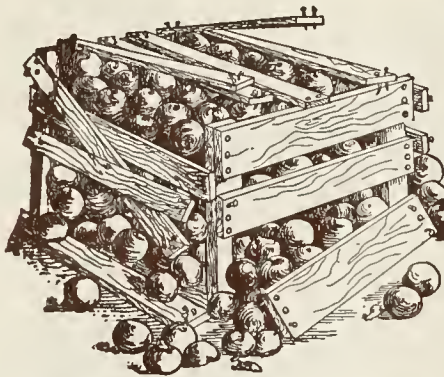
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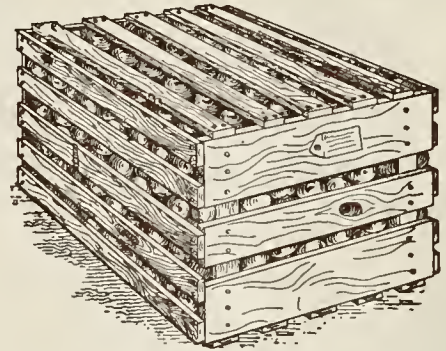
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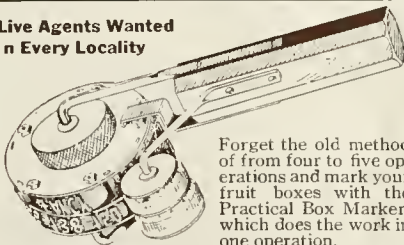
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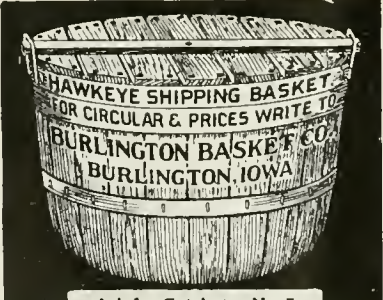
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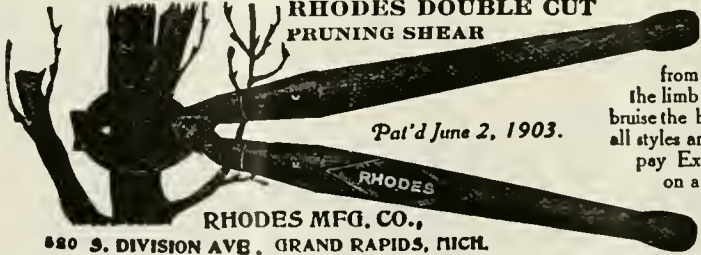
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AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

The Effect of Retail Prices on Fruit

By Ralph E. George, Department of Economics and Business, Whitman College, Walla Walla, Washington

A FACTOR of great importance in the marketing of large fruit crops is the elasticity of prices. The great majority of apple producers recognize at present that one handicap which they must overcome is the failure of retail prices to fluctuate with the prices received by the farmer. At the present time the normal difficulties in selling the crop in years of large production are greatly increased by the apparent inability of the farmer to secure larger consumption of apples in years of large crops than in years of small crops. Unless the consumers can be induced to eat more apples when a large crop is produced, the farmer must naturally suffer heavy losses. In the past this increased consumption on the part of the general public has been most difficult to secure, with the result that in such years much of the crop has frequently gone to waste or been sold at great loss. This failure, however, can largely be traced to the fact that retail prices seldom represent with any accuracy general crop conditions and prices. The farmer may be receiving extremely low prices where the retailer is charging the same or only a slightly lower price than in short years. The wholesale market may be glutted, apples may be spoiling in the terminals, farmers may be receiving unremunerative prices and still the retail price may be the same as in periods of scarcity. When consumers' prices change so little, it is natural that consumption should not be materially increased. The effect of lowering prices in increasing the consumption of such a commodity as apples can hardly be overestimated. A reduction in prices is one of the standard methods adopted by all big stores and other retail distributors to sell a surplus stock. Take, for example, the method now followed by the big clothing stores. Almost each season such stores offer for sale at presumably reduced prices the samples of their stock, thus preventing any accumulation and storing of stock, with all the loss which such a policy causes. The apple is in much the same market position from the standpoint of the consumer. It is not at present a standard article for consumption. It does not enter into the necessary budget of the average family as does sugar. Under such conditions, it becomes a luxury which will be affected very materially in its consumption by the price of the commodity. In the case of another luxury, the automobile has been increased enormously by lowering the prices and advertising the reduced prices. So if the retail price of

apples could be lowered in periods of so-called overproduction it would be possible to increase consumption to a very marked degree. Families with low incomes, unable in the past to buy apples, would then consume them and families of higher incomes would demand more apples or apples of better quality. It seems evident, then, that lowered retail prices would do much to dispose of the crop in years of overproduction.

To secure these lower retail prices when the farmer's returns are low is one of the problems which the farmer must study. Various factors are responsible for the inelasticity of retail apple prices. The conditions which are the result of our present system of marketing through a long series of middlemen undoubtedly tend to keep retail prices more or less rigid. But one of the most important factors is the lack of knowledge concerning the conditions of the apple crop, a lack of knowledge prevalent not only among the consumers but also among the retailers. By the time a number of dealers have bought and sold the apples knowledge of crop conditions has become so dissipated that the retail grower does not realize the actual conditions of the market. But if the grower is frequently only slightly informed concerning the seasonal crop, the plight of the consumer is much more dense ignorance. Seldom indeed does the consumer know that the crop is large or small, of good or poor quality. He is generally inclined to consider the retail price as a sign of general conditions, if he considers the question at all.

But if more adequate information were available to the consumer much of the present rigidity of prices should disappear. In seasons of large production he would be inclined to demand from his grower lower prices for this much-prized commodity. Furthermore, he would watch for lower prices with the expectation of buying more or better apples as they came on the market. This attitude on his part would do much toward making more elastic prices possible. One factor making the average retailer conservative in the purchase of apples and in the setting of prices is the fear that he may be unable to sell more than his accustomed amounts. When he feels hesitant to lower prices because he feels this step will not increase his trade greatly he cannot be blamed much. In many cases he does not feel able to advertise these lower prices, and consequently doubts the effect of lowered

prices in increasing consumption. He consequently prefers to secure a certain profit from his business rather than to run risks of lessening that fairly certain profit. If the consumer, however, is looking for lower prices and expecting to increase his purchases, the grower will change his opinion on the question of the price level. If the retailer himself is not required to advertise these lower prices, if the consumer is well informed on the general crop and market conditions, then the grower will feel that lowered prices will result in increased sales, and that therefore such a policy will prove profitable to him. There is, furthermore, a more pronounced advantage to be derived from the education of the consumer on such questions as that of the wholesale market. In these days of criticism of the middleman, all retailers are on the defensive with regard to this change. If they feel that the consumer knows that wholesale prices have been reduced and that consequently lower retail prices should be made, the retailers will be inclined to satisfy the informed demand of the customer for lower prices. The education of the consumer, then, on question of production and wholesale prices is of very great importance in determining retail prices. If the general body of apple consumers understand that the crop is large and that the wholesale prices are lower than usual, the grower will not hesitate long in lowering his retail prices accordingly. This lowered retail price, it must be remembered, is of great value to the farmer through its effect in stimulating demand. Consequently the widespread education of the general public as to market conditions becomes a question of considerable importance to the farmer when he is considering ways and means of disposing of a large crop. The more directly apple prices to the consumer fluctuate with wholesale prices and the more the consumer understands concerning the wholesale prices, the more elastic will be the demand and the higher prices will be in periods of large crops. The consumer will be trained to look for lowered retail prices and on a decline in these prices will buy larger quantities.

If this view be correct, among the questions which the farmer should consider is that of securing this education of the general consuming public as to market conditions and prices. At first glance this would seem to be a most difficult proposition. Yet recent changes are making such a proceeding not only possible but practicable. In

some cities wholesale brokers are already considering this problem. As an example of such developments the Produce Organization of Pittsburg has recently decided to take advantage during the coming year of newspaper reports on the markets to inform the public of fluctuations in the wholesale prices of various commodities. This organization believes as a result of such a step a larger consumption and lower retail prices can be secured with profit and satisfaction to themselves and to the community alike. Were such methods adopted in all cities, considerable information would be made available to the public. Then the Consumers' Leagues in the various cities are already doing good work along these lines. In some cities such leagues have notified their members and the public of changes in wholesale prices and have demanded from their growers correspondingly lower prices. On certain occasions when retailers de-

clined to lower prices materially, these organizations have even gone so far as to advise their members to refuse to buy such commodities until prices had been lowered, thus practically declaring a boycott, with the result that the retailers were forced to yield. In addition to these direct movements much general information is being placed before the consumer. Newspapers, as a result of the modern demand for such information, are devoting more and more space to market reports. The government is also assisting through its rapidly developing crop reports, which now reach directly or indirectly large numbers of consumers. Many other organizations and agencies which are doing somewhat similar work might be cited.

Since such a change is already taking place, the farmer can well afford to assist the movement. This assistance can be given in various ways. Close relations should be formed with the

various organizations disseminating knowledge and material of great value can be placed in their possession. It might prove desirable to furnish the newspapers with direct market information. Then the Department of Agriculture should be encouraged to widen the scope of the work along this line and to make its bulletins more available to the consumer. As a more direct step, the various apple-marketing organizations may find it profitable to adopt advertising methods which will place the facts in the hands of the consumer. In these various ways it should be possible to bring retail and farm prices more nearly into line, to make them move together, to develop an elastic demand which will consume more apples when the price is lowered and thereby prevent the extreme fluctuations in prices which now cause considerable risk and loss to all farming operations in such industries as that of apple production.

Advertising and Merchandising Northwestern Apples

By R. C. Gano, Editor Judicious Advertising, Chicago, Illinois

MERCHANDISING is a science which no group of apple growers has yet mastered and applied to the marketing of apples. It doesn't matter how many groups of apple growers have mastered the science of growing fine apples, provided only one of the groups uses merchandising science. That one group which, in addition to growing apples as fine as any others, establishes a selling system which is basically correct will inevitably lead in the markets. At the present time there is a remarkable opportunity for some one group of apple growers to take the lead in the apple market and keep it. The only qualifications they need are two. Their apples must be able to hold their own against other apples on a basis of plain quality and merit. And the growers must be willing to adopt the most efficient marketing plan that can be devised, and must have the grit to see it through.

The apple growers of the Northwest have heard such talk as the above before, have hearkened to it, and have conscientiously attempted to get together on a marketing plan. That no plan has accomplished much to date either indicates that the plans were good but were not thoroughly "sold" to the growers, or that the plans, though thoroughly believed in by the growers, were actually faulty, or that both the plans and the growers' mental attitude toward them were at fault. For there is no question that a plan which actually solves the problem and which shall enlist proper support will succeed. To doubt this is to admit that you are licked before the fight begins.

Now I don't doubt that the apple growers of the Northwest have had the example of the Sunkist orange growers cited to them time after time, when movements were on foot to form marketing organizations. But it is one thing to have a person say to you,

"Why, look what co-operation has done for the California Fruit Growers' Exchange" and quite another to have certain intimate inside facts about the California Fruit Growers' Exchange that really illuminate the apple problem presented in a way that appeals to mathematical and business sense.

As regards the point that apple production is widespread and orange production concentrated, a little reflection will show that this difference is apparent only to the producer, not to the consumer, and hence makes no difference so far as the effect of advertising is concerned. When a consumer goes to a grocery store for oranges she is confronted with a variety of unknown brands and only one known brand—Sunkist. This isn't true of every consumer, but the average housewife can name only one single brand of oranges. This has been proved by the California Fruit Growers' Exchange by house-to-house canvassing. An average test in

a certain city showed that of 772 housewives canvassed 45 per cent said they buy Sunkist oranges, and only a single person out of the 772 named another brand of oranges, during the questioning by the investigators. Orange competition may be narrowly restricted. Yet at any grocery store one will find several competing brands. Sunkist will be one of, say, four. Does the consumer know anything about the market conditions surrounding oranges? Rarely. All she knows is that in Sunkist she recognizes a familiar name with pleasant associations and advertised as California's highest quality orange.

It makes no particle of difference that oranges are grown only in two states instead of forty-five. The grocer would probably not handle more brands than he does in any event. Advertising does its real work when the consumer, at the store, or in 'phoning her grocer, is confronted with choosing among sev-



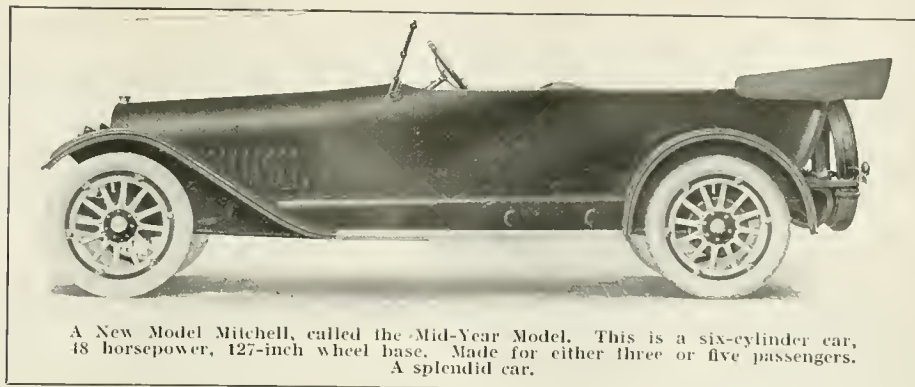
The International Motor Truck, manufactured by the International Harvester Company, in four models—one of 1,000 pounds, two of 1,500 pounds, and one of 2,000 pounds. This type is meeting with a very extensive demand and giving satisfaction to truck users.

eral brands or just saying "oranges." A few years ago nobody ever thought of saying anything but just "oranges." But today many consumers are asking over the 'phone for "Sunkist oranges," and others, when glancing over the pyramids of oranges, will point and say "those." The pile indicated will show the word "Sunkist" on the tissue paper wrappers. Many grocers will sell more Sunkist oranges than they sell of three other brands combined. If customers select at all they select Sunkist.

If a certain brand of apples, or apples packed by a certain association, were clearly identified in the public mind, exactly the same thing would happen in the grocery stores as is happening in the case of oranges. There would be one known "friendly" kind, and several unknown "stranger" kinds. That apples are grown all over the United States and oranges only in two states would be an entirely irrelevant circumstance. The known kind of apple would be selected. It is human nature and it explains the power of advertising. To me personally, who presents an exaggerated case of familiarity with the Sunkist brand, an orange tastes infinitely better if I take it out of a Sunkist wrapper. It is more than an orange. It is an old friend, and recalls to my mind pleasant pictures in colors of sunny orange groves and palm trees and missions in Southern California.

Now, to give the reader a little perspective on the Sunkist achievement, I will review very briefly the rise of the California Fruit Growers' Exchange. Twenty years ago there was no system in marketing California oranges. Buyers would buy when they saw in their limited horizon a chance to sell at a profit, and when possible they conspired against the growers to beat down prices. The growers naturally had to begin co-operating locally instead of cutting each other's prices. That was the start of the co-operative spirit, and it was seen to accomplish such excellent results that it gradually led to broader and broader organization. Facing overproduction in 1895, when production was 5,000 carloads, the California Fruit Growers' Exchange, through organizing a national selling machine and developing the market, has made possible an 800 per cent increase in crop in twenty years.

An important milestone was reached in 1907, when their system of selling through salaried agents stationed in the principal markets, appeared to have



A New Model Mitchell, called the Mid-Year Model. This is a six-cylinder car, 48 horsepower, 127-inch wheel base. Made for either three or five passengers. A splendid car.

reached its limit in sales figures, and overproduction again threatened. Newspaper advertising to announce arrivals of carloads of oranges had been used to some extent at that time, but every local association was still selling under its individual brand name. An advertising agency was consulted, and the adoption of a single brand name and national advertising were decided on, after a test campaign in one state. This campaign was to have a twofold purpose. It was to create a preference for Exchange oranges as against competitive growers, but it was also to persuade the whole nation to eat more oranges than formerly, expanding the market generally.

Since the advertising started the lowest average price per box of Exchange oranges for a season has been \$1.71 and the highest price has been \$2.75 per box. This high price was secured in a year when climatic disturbances destroyed much fruit, reducing shipments to 53 per cent of the previous year. But the market was so well understood by the Exchange that it secured record prices, and cash returns equaled 79 per cent of those of the previous year. The advertising appropriation has steadily increased from \$5,000 for the test campaign to \$375,000 for 1915-16; and this expenditure does not include premiums, which practically pay for themselves. That the advertising has accomplished the results desired is proved by the growth of the appropriation and by the aggressive plans of the Exchange growers. They expect to double their shipments in five years' time, and depend on increased advertising to make consumer demand keep pace with increasing production.

How this \$375,000 appropriation is spent should be of interest. \$230,000 was spent during the past year in ad-

vertising oranges in magazines and newspapers, and \$100,000 in advertising lemons. The remainder was spent for window display matter for retailers, for circular announcements to the wholesale and retail trade, for recipe booklets, etc.

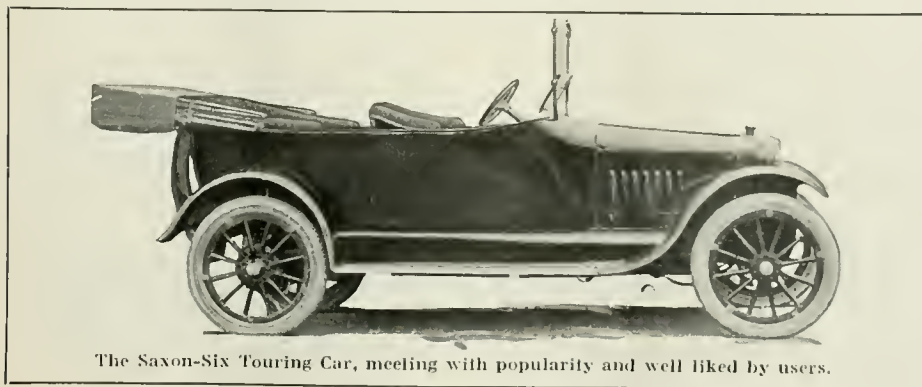
The aggregate circulation of the newspapers used was nearly 15,000,000, and as a series of seventeen advertisements was used in each paper there was a total circulation of 104,169,000. The magazines mainly used were the Saturday Evening Post, Ladies' Home Journal, Woman's World, Collier's, Mothers' Magazine, People's Home Journal, People's Popular Monthly, Ladies' World, Christian Herald, Literary Digest, Youth's Companion, Good Housekeeping, National Sunday Magazine. Their aggregate circulation was over 13,000,000 and the fifty-four advertisements used received an aggregate circulation of over fifty-two millions.

As a special inducement to make people specify Sunkist and to make dealers leave the tissue wrappers on the oranges these wrappers have been given a cash value by offering orange spoons and other plated silverware in return for them and a small amount of cash. A more recent premium offer has consisted of an orange and lemon-juice extractor of glass.

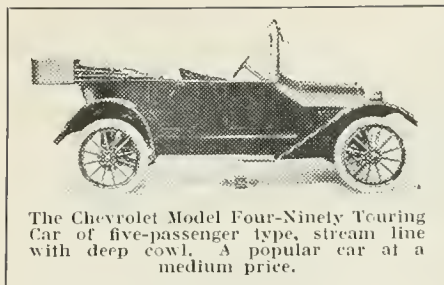
The logical appeal for the advertising to make has been most carefully analyzed, of course. Delicious taste is considered the strongest appeal for magazine advertising of oranges, but quality, healthfulness, culinary uses, price and premiums are also emphasized. For lemons the appeals rank as follows: Culinary, health, household uses, toilet uses. Much of the advertising has been in colors and all has had high artistic value.

The recipe booklets have been widely distributed in response to direct inquiries, which have of course indicated to some extent the pulling power of the advertising. These have been valuable in increasing consumption by telling people of many new and attractive ways to serve oranges. New ways of serving the fruit have also been indicated on counter cutouts and hangers for grocery stores.

That the same tactics can secure larger consumption of apples was proved by the Canadian government in the fall of 1914, when the European war had closed a number of accustomed outlets for the Canadian apple crop. Growers would have lost heavily



The Saxon-Six Touring Car, meeting with popularity and well liked by users.



The Chevrolet Model Four-Ninety Touring Car of five-passenger type, stream line with deep cowl. A popular car at a medium price.

had not the government undertaken a newspaper campaign in paid space in which the goodness of the Canadian apple was advertised to Canadians and a recipe book telling new ways to serve apples offered. A series of twelve advertisements in sixty dailies and weeklies brought in 60,000 inquiries for the recipe book, and the resulting purchases of apples by the public consumed the entire surplus.

There is no question but what apple consumption can be increased by a proper advertising campaign. To the writer's way of thinking there certainly is not. The great problem seems to be to secure concerted action, and that can only come following concert of opinion. I have not space here to describe the inter-working of the local, district and central bodies in the California Fruit Growers' Exchange, but there is nothing of importance in those functions that is dependent on the growers being geographically so close together. The same form of organization could be secured by the apple growers of the Northwest, despite the fact that they cover larger territory—and an apple association could perform all of the important services performed by the California Fruit Growers' Exchange and its branches. Those services consist, broadly, in maintaining a national sales organization, increasing demand through advertising, furnishing a daily market report to local associations, pooling and standardizing output, operating a supply company, a traffic department and attending to minor matters on a co-operative, and therefore more economical, basis. The traffic department alone, through obtaining reductions in freight rates on oranges and lemons, and in refrigeration rates, saved the Exchange growers in the period from 1904 to 1912 nearly five million dollars. Representing so many growers it is able to drive a hard bargain with the railroads. Again, estimating in advance the season's production has been done with great accuracy by the Exchange, because it is able to secure confidential reports from every section of the orange-producing territory; and this is a great advantage in that it enables growers to distribute shipments evenly over the shipping season and never allow supply to become too heavy for demand. The operating cost of the Exchange represents the selling cost of the growers and is the lowest known in the agricultural world, being less than 3 per cent on gross sales.

Now suppose that a new Northwest Apple Growers' Exchange should be

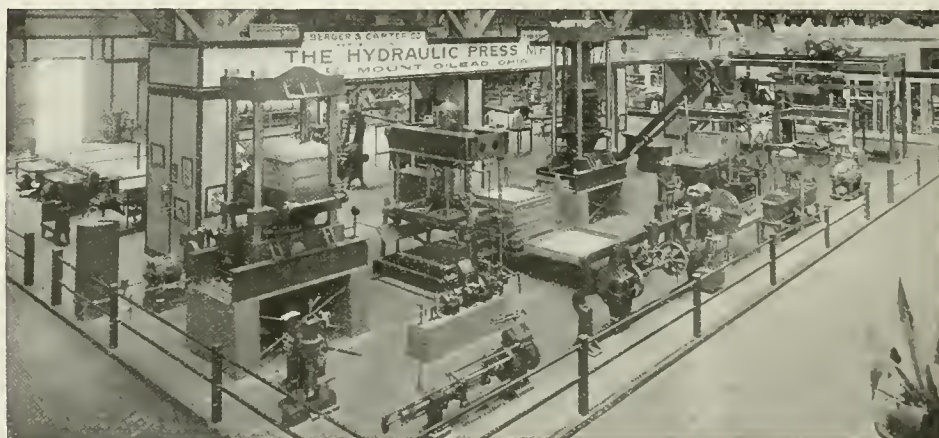
formed, or one of the old ones revived, and instead of adopting a name under which all the best-grade product should be included some such mark as the following should be adopted to identify fruit packed under the direction of the Exchange:

CHAXNGE

Such a mark as this could be featured very nicely in dark-green outline letters on a tissue-paper wrapper, the apples of the best grade could be pooled according to varieties, well cleaned and wrapped, the name of the variety appearing in red letters above the green trade-mark, while the name of the local association, if desired, could also appear in red below the trade-mark. The wrappers could be given a small value of their own by means of a premium offer. This is important, as it necessitates the retailer leaving the fruit wrapped, and only in that way can an apple be identified to the consumer. It also furnishes an extra inducement to the consumer to specify the special brand. Then the advertising slogan might be something like this: "Insist on CHAXNGE apples." It could be explained that this trade-mark indicates the best grade of fruit of the different varieties from the greatest apple-producing country in the world, the Northwest; and that all CHAXNGE apples are packed by the Eden Exchange and guaranteed to be extra quality. The various varieties packed

by the Exchange could be listed, and that these apples are cleaned in a sanitary way and wrapped so that they will stay clean and unmarred could be emphasized. The value of the wrappers would of course be explained and a recipe book offered. By featuring prominently the name of the exchange, which should be short and easy to remember, the consumer could be made to understand that the trade-mark CHAXNGE does not mean a particular variety of apple but is used on all varieties packed by a certain exchange. I think this would not be then so much a brand name as a device to identify the various products of a single packing organization.

It seems certain that such a program, with all of the minor details carefully worked out, would result in a wider consumption of apples and in a special demand for the advertised brand. Of course the little things count high in the success of any co-operative plan, and the importance of investigating the methods of such organization as the California Fruit Growers' Exchange cannot be overestimated. Success would not come in a day, but it is fortunate that it would not, for when success becomes pronounced imitation by competitors begins. Where success requires several years of preliminary work the organization which is first and gains that much of a start over its competitors is very apt to retain its lead and to increase it. Circumstances can never rob the first organization of its extra years of experience.



The above picture shows the exhibit of the Hydraulic Press Manufacturing Company, Mt. Gilead, Ohio, at the Panama Pacific International Exposition. The exhibit was a splendid tribute to the enterprise of this well-known firm, that had the distinction of winning high honors at the Exposition. This illustration should be interesting to apple growers, particularly at the present time, for the reason this company manufactures a large number of cider and vinegar presses of all sizes, made for the use of the small individual grower or the large manufacturing plant. "By-Products" is a subject that every fruitgrower should be interested in, and one that every fruitgrower should investigate. It is becoming a

well-known fact that fruitgrowers in the East have preserved the waste for many years, and it is now admitted that fruitgrowers of the Northwest must do so to assist in making their business a profitable one. There are many grades and varieties of apples that will not justify shipping east or to other consuming points on account of the freight. They should be saved instead of being allowed to rot. It is to be hoped that this wonderful exhibit will indicate to the fruitgrowers of the Northwest how extensive the business of cider and vinegar making is carried on in the East and induce them to save the fruit they cannot ship, instead of feeding it to the hogs or allowing it to rot on the ground.

The men who sold you your fruit trees say:

"Your trees must be planted right if they are to thrive. Make the holes deep and wide and break up the subsoil. The best way to do this is by blasting. Trees set in blasted beds grow faster and larger and bear earlier. They are sure to grow when first planted and in blasted soil they will stand both dry and wet weather better."

Blast with

GIANT FARM POWDERS

STUMPING — AGRICULTURAL

—which do their work cheaper and *better* than ordinary dynamites. These improved explosives—made in two brands, Eureka Stumping Powder and Giant Stumping Powder—are prepared especially for Pacific Coast *farm and orchard* work. They pulverize the soil several feet deep and wide, and place it in the best condition to insure the rapid growth of trees and crops.

Be careful to get the genuine, made by the company which originated all "giant powders." If your dealer has only ordinary dynamites, write us and we will see that you are supplied with the *real* Giant Powders.

Get this valuable Free Book

You will find information worth many dollars to you in the Giant TREE BOOK, "Better Orchard Tillage." This book is written especially for Pacific Coast fruit growers. It tells how to have thriftier, faster-growing, earlier-bearing trees by planting in beds blasted with Giant Farm Powders.

Mail the Coupon

Mark and mail the coupon—or a postcard—and this valuable book will be sent *free*. Do it *now*—before you forget it. Other illustrated books on Stump Blasting, Boulder Blasting, Subsoil Blasting and Ditching, will also be sent on request.

THE GIANT POWDER CO.

CONSOLIDATED

"Everything for Blasting"

Home Office: San Francisco

Distributors with magazine stocks everywhere in the West.

Nearly every Western nurseryman recommends blasting for tree planting. Read these statements:

OREGON

Giant explosives are of great benefit for blasting beds for orchard planting. The difference in growth between unblasted trees and trees in blasted ground is so much in favor of the latter that no adequate comparison can be made. Blasting increases absorption of soil moisture, permits deeper rooting and induces better growth and yields.

DONALD NURSERY CO., Donald.

Powder will loosen the soil, giving it a better chance to become aerated and making it more retentive of moisture.

OREGON NURSERY CO., Orenco.

Explosives are of great benefit in planting an orchard as the ground should be loose enough to allow roots to go to their natural depth easily.

BENEDICT NURSERY CO., Portland.

It is of advantage and even necessary to the success of the orchard to blast the holes.

ALBANY NURSERIES, Albany.

WASHINGTON

The yield is often three times as great on blasted soil.

ROSECKROFT NURSERY, Sumner.

We have always recommended planting with explosives.

CHRISTOPHER NURSERIES, Clearbrook.

We consider the use of explosives an important factor in planting orchards. It is important to secure good drainage and the roots should be able to penetrate deeply into the subsoil.

PUYALLUP NURSERY, Puyallup.

CALIFORNIA

Blasting will allow the roots of trees to go down to the good soil.

VALLANCE NURSERY, Oakland.

We advocate the use of explosives for loosening up compact soils and hardpan in tree planting, knowing the value of such work.

FANCHER CREEK NURSERIES, Fresno.

Trees planted in blasted soil do much better.

ROBERT DUNN, Ventura.

FREE BOOK COUPON

The Giant Powder Co., Con.
202 Kohl Bldg., San Francisco

Send me your illustrated books on the subjects which I have marked X.

☐ Stump Blasting ☐ Tree Planting
☐ Boulder Blasting ☐ Ditch Blasting
☐ Subsoil Blasting

Name _____

Address _____

Write below your dealer's name

We carry in Portland
Stock Labels for Apples, Pears,
Strawberries and
Cherries

Can make shipment of
Printed Stock Labels in 24 hours.
Send for Samples
and Prices

ATTRACTIVE FRUIT LABELS

REASONABLE

THE SIMPSON AND DOELLER CO.

1423-24 NORTHWESTERN BANK BLDG.
PORTLAND, E. SHELLEY MORGAN, MANAGER. OREGON.

Apple Production and Value by Varieties

[From the Department of Commercial and Industrial Service, School of Commerce,
University of Oregon, May 2, 1916]

MORE Ben Davis apples were produced last year than any other variety, the estimate being 11,100,000 barrels (of three bushels), or 14.5 per cent of the crop. Baldwins ranked second, with 8,312,000 barrels, or 10.9 per cent, and Winesap third, with 5,545,000 barrels, or 7.3 per cent of the total crop. Of the total crop produced, about 65 per cent was sold, varying by varieties from 77.7 per cent of the crop of Tompkins Kings sold to 42.7 per cent of Limbertwigs, which were sold by producers.

The variety receiving the highest average f.o.b. harvest price is the

McIntosh, being \$2.50 per barrel, seconded by the Yellow Newtown at \$2.40. The variety receiving the lowest price is the Limbertwig, \$1.41 per barrel, but closely followed by the Ben Davis at \$1.42. These estimates are United States averages, based upon reports from a large number of apple growers and specialists to the Bureau of Crop Estimates.

About 18 per cent of the crop was classed as "summer" apples, 25 per cent "fall," and 57 per cent "winter" apples.

Estimated averages for the United States for important varieties of apples follow:

Variety	Produced		Sold		F. O. B. Harvest Price
	Pct. of Crop	Barrels	Pct. of Variety	Barrels	
Ben Davis	14.5	11,100,000	59.5	6,608,000	\$1.42
Baldwin	10.9	8,312,000	72.1	5,990,000	1.38
Winesap	7.3	5,545,000	61.1	3,385,000	1.35
Jonathan	5.9	4,489,000	72.2	3,244,000	1.32
Greenings	4.7	3,595,000	75.6	2,717,000	1.37
Rome Beauty	4.6	3,524,000	63.8	2,251,000	1.70
Wealthy	4.3	3,296,000	65.6	2,163,000	1.63
Grimes Golden	3.8	2,913,000	68.4	1,993,000	1.76
Northern Spy	3.8	2,878,000	72.2	2,078,000	2.05
York Imperial	3.2	2,456,000	67.0	1,647,000	1.68
Oldenburg	2.9	2,185,000	61.3	1,339,000	1.57
Gano	2.4	1,852,000	65.7	1,217,000	1.16
Staymen Winesap	2.3	1,770,000	67.2	1,190,000	2.00
Limbertwig	2.0	1,511,000	42.7	616,000	1.41
Yellow Newtown (Pippin)	1.7	1,324,000	75.2	996,000	2.10
Fameuse (Snow)	1.3	996,000	67.1	668,000	1.84
Tompkins King	1.3	975,000	77.7	758,000	2.21
Yellow Bellflower	1.2	939,000	65.6	616,000	1.81
Golden Russet	1.2	879,000	58.4	513,000	1.66
Wagener	1.1	822,000	75.7	623,000	1.81
McIntosh	1.0	773,000	64.6	500,000	2.50
Gravenstein	0.9	669,000	77.0	516,000	2.02
Others	17.7	13,545,000	57.7	7,829,000	1.64
Total	100.0	76,350,000	64.7	49,487,000	\$1.78

The above totals do not include 320,000 barrels grown in Rhode Island, South Carolina and Nevada, where data were insufficient.

Wanted

Position as foreman or superintendent on a fruit or general farm by young married man; agricultural college graduate; experienced on both fruit and dairy farms. Strictly temperate; good references.

Address R. W. M.,
2219 H. Street Bellingham, Washington

HARVEST YOUR FRUIT WITH THE American Fruit Clipper

Saves time, labor and money. Send for particulars.

Clipper for either hand, \$1
Clipper with attachment for picking cherries, \$2

The American Fruit Clipper Co.

509 BROWN BUILDING

OMAHA, NEBRASKA

Nearly 15 per cent of last year's apple production was wasted or eaten by live stock; 19 per cent was consumed on farms for human purposes, other than as cider; 10 per cent was used to make cider; and 56 per cent was sold from farm or orchard (excluding that used for cider.) These figures are estimates based upon reports from a large list of apple growers and specialists to the Bureau of Crop Estimates.

If these percentages be applied to the estimated total production of apples last year, 76,670,000 barrels, it would indicate that 43,117,000 barrels, or 129,000,000 bushels, were sold from farm or

orchard, except for cider, 22,000,000 bushels used for cider, 45,000,000 bushels consumed for human use on farms, except for cider, and 34,000,000 bushels wasted or eaten by live stock.

The estimate of total production last year of 76,670,000 barrels was obtained by applying to the census figures of production in 1909, an estimated increase since then of about 57 per cent. It is not likely, however, that the census enumeration included all the wasted portion of the crop.

The value of the portion sold is estimated at 69 cents per bushels, indicating a total of about \$89,000,000; that used for cider, 23 cents per bushel, or a total of \$5,000,000; consumed on farms, 53 cents a bushel, or a total of \$24,000,000; and that wasted or eaten by live stock, 15 cents per bushel, or a total of \$5,000,000.

Articles of Incorporation of the Fruit Growers' Agency, Inc.

We, the undersigned fruitgrowers and sales agents, realizing the advantages to be gained by co-operation among the fruitgrowers and their resident agencies in the States of Washington, Oregon, Idaho and Montana, for

The Fallacy of Paraffine base: Eastern oil manufacturers have long extolled the superior virtues of paraffine-base motor oils. But Pacific Coast motorists have proved that Zerolene, made from selected California crude, asphalt-base, gave best results. Their experience is now supported by the testimony of international experts. Lieut. Bryan stated before the Am. Soc. of Naval Engineers: "Oils made from the asphalt-base crudes have shown themselves better adapted to motor cylinders, as far as their carbon-forming proclivities are concerned, than are paraffine-base Pennsylvania oils." Zerolene received highest competitive awards, San Francisco and San Diego Expositions. Dealers everywhere and at service stations and agencies of the Standard Oil Company.

ZEROLENE
the Standard Oil for Motor Cars

the purpose of forming a corporation to supervise the uniform contract which the growers and growers' agents deem both desirable and necessary, and for generally promoting the fruit industry in the Pacific Northwest, hereby make and subscribe, and do hereby adopt the following articles of incorporation, to-wit:

ARTICLE I.—Name

The name of this corporation under which it shall do business shall be "The Fruit Growers' Agency, Incorporated."

ARTICLE II.—Purposes

This exchange is organized for the purposes of supervising the performance of a uniform contract which exists between the growers and their respective sales agencies, for the selling of the fruit products of the Pacific Northwest; to provide the means and facilities for carrying out the provisions contained in this contract as hereinafter set forth; to establish and maintain an "exchange" for the promotion of business and social relations among its members, and especially the advancement of the mutual interests of the fruitgrowers and fruit shippers of the Pacific Northwest by all proper and legitimate methods; to collect and disseminate information; to secure improvements in transportation and storage services and conditions; to encourage competition by honorable methods only; to adjust by fair and equitable means grievances and differences; to correct trade evils and abuses; to prohibit all customs not in accordance with sound business principles; to secure the unification of contracts and accounting methods; to secure uniform methods in the physical handling, grading and packing of fruit from tree to ear; to provide the necessary facilities for the extension and development of domestic and Canadian markets; to provide the necessary facilities for the promotion and conduct of export shipments and sales and work through joint agents and consignees for this purpose; to underwrite steamship charters and develop new fruit trade routes; to co-operate with federal agencies in such lines of work as they may undertake in behalf of the fruit industry; and to form and carry out plans for the mutual protection and benefit of its members in the harvesting, marketing and distribution of the Pacific Northwest fruit and produce crops.

To enable this corporation to carry out the purposes for which it is organized, it shall have the power:

1. To do all things necessary, proper and legal to carry out the purposes of its organization as above stated.
2. To buy, rent, lease, acquire and own such property, real or personal, as may be necessary for carrying on the business of the corporation and to sell, lease, mortgage, re-lease and handle the same.
3. To aid in any manner any corporation or association organized for like purposes as this one, and to do any acts and things necessary for the success thereof and to assist it in carrying out the purpose of its organization. To co-operate with and become a member of any State, Interstate or National organization organized for the same general purposes as this.
4. To borrow money and secure the payment of the same by bond, mortgage, note, hypothecation or pledge of any property belonging to the corporation and to issue such promissory notes, bonds, debentures or other evidences of indebtedness as may be deemed necessary by the Board of Trustees, to meet and discharge its obligations, to advance and promote the lawful purpose of its creation.
5. To make and enter into contracts with its members, other persons, associations or corporations, and to do any and all other acts and things necessary to carry out the purposes of its organization and which may be authorized by law, and to assist its members in every way practicable in the conduct of their business.
6. To sue and be sued.

ARTICLE III.—Membership

This organization shall have no capital stock nor shall any shares therein be issued.

The corporation shall prescribe the qualification for any membership and the terms, conditions and character thereof, and fix the rights and privileges of the member. It may have a voting and a non-voting membership and fix the membership fee accordingly. The corporation shall issue membership certificates, which shall be assignable or transferable only under such rules and regulations as

Correcting Unsanitary Orchard Soils



Drawn from actual photo.—Note marked difference in growth between tree planted in blasted hole and tree planted in spade-dug hole.

Unsanitary soil conditions are serious handicaps to the growth of orchard trees.

They are the direct cause of certain root diseases.

They limit the amount of plant food that is available, and cause mal-nutrition.

Root diseases and lack of food stunt the growth of trees and reduce the amount of fruit produced.

Slow growth, mishapen branches, small leaves and pale color of leaves are some of the signs of bad soil sanitation. When these are noticed, the faulty conditions should be corrected at once.

The trouble may be caused by shallow soil, hardpan, tight clay, or bad drainage. Rational blasting gets directly at the seat of trouble and relieves some of the most pronounced cases by shattering the hardpan and deepening the soil,

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- 8 Made in one size **only**.
- 9 Made on order only.
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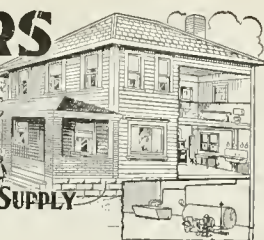
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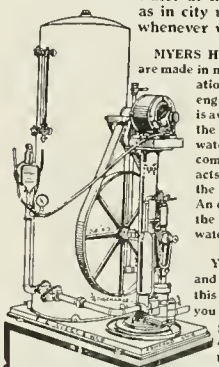
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may be prescribed by the by-laws of the corporation.

No service shall be performed by this corporation for profit, nor shall any goods, wares or merchandise be handled or sold for profit. For all services rendered to its members they shall be charged therefor only such amounts as shall be necessary to pay the expenses of such service. This to include all necessary expenses incurred in handling the affairs of the corporation, including interest, fixed charges and salaries and such amounts as may be set aside to establish a surplus fund, if the members of the corporation shall deem it advisable to establish such a fund.

ARTICLE IV.—Place of Business

The principal place of business of this corporation and its home office shall be in the City of Spokane, County of Spokane, State of Washington.

ARTICLE V.—Terms of Existence

This corporation shall exist for a term of fifty (50) years.

ARTICLE VI.—Incorporation

The officers of the corporation shall be a president, a vice-president, a treasurer, an executive secretary and such other officers and agents as the Board of Trustees shall from time to time authorize. All notes, mortgages, bonds and other evidence of indebtedness shall be drawn in the name of the corporation, signed by the treasurer and countersigned by the president. The executive secretary, with the approval of the president, may bind the credit of the corporation in any sum not exceeding \$500.00. In order to bind the credit of the corporation for any sum in excess of \$500.00, a written resolution authorized by the Board of Trustees shall be necessary.

ARTICLE VII.

The Board of Trustees shall be composed of not less than eleven voting members, five of whom shall be exclusive growers, five of whom shall be exclusive sales agents. The eleventh member of said board shall be elected from the active membership and may be either a grower or a sales agent.

Whenever it appears that the active voting members is a partnership, association or corporation, it shall, if a partnership, select one of its members, and if an association or a corporation, an officer, and shall certify his name, and upon such certification, the said members or officer shall be deemed eligible for election to membership on the Board of Trustees.

Officers of the Fruit Growers' Agency, Incorporated

Paul H. Weyrauch.....President
J. B. Adams.....Vice-President
P. R. Parks.....Temporary Secretary

TRUSTEES

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It gives you a high grade quick selling product at a minimum cost. It makes a clean and natural tasting product. Dehydrated fruits and vegetables have been approved by the U. S. Government, while desiccated, dried and evaporated products have been rejected. There is but one Dehydrator manufactured in the West and it is the best By-Product machine ever devised. It is adapted to the individual grower, as it can be constructed to meet any and all requirements. It is fully covered by U. S. patents. Therefore, you are protected in its use.

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PREPAREDNESS

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We issue a small catalog containing articles of proven worth, time savers and money savers. Things you will need and need badly during the summer and fall.

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Fruit Ladders Picking Bags Picking Pails
Nail Strippers Lid Presses
AND MANY OTHER ORCHARD SUPPLIES

The combination of quality and price which we offer you is an interesting feature of this line. Prepare now if only to the extent of sending for this catalog of Orchard and Packing House Supplies.

THE HARDIE MFG. CO.

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PORTLAND, OREGON

Fruit Industry Paraphrased

Monthly Apple Consumption.—The United States government has given out the following estimates in reference to the monthly consumption of apples in barrels: June, 1,500,000; July, 6,400,000; August, 8,800,000; September, 15,500,000; October, 26,700,000. Figuring on a percentage basis: June, 3%; July, 11%; August, 15%; September, 25%; October, 45%. It is to be regretted that these figures, as far as we know, do not include the consumption for the months from November to May, inclusive. However, it seems wise to call attention to the fact that fruitgrowers, dealers and operators should look out that the month of June doesn't catch them with much on cold storage, as it is certainly bogy month of the year. It is also true that May is somewhat of a bogy month also, as at that time strawberries and fresh vegetables are coming on the market, reducing the normal consumption of fruit.

President Barry of the Western and New York Horticultural Society states in an article recently published in a book issued by the society, that the official count in New York State shows 24,988,707 fruit trees of all kinds, of which 14,076,718 are apple trees, which produced 25,409,324 bushels. President Barry quotes a New York Central official by saying: "More apples were shipped from five centers in New York State fruit belt than were produced by Oregon and Washington combined."

Estimates.—Oregon, Washington, Idaho and Montana shipped about 10,000 cars of apples in 1915. There were many who figured this year would be one of immense production. Estimates were made, but apparently all estimates were based on the fact that all orchards of all ages in all districts would produce a heavy crop. Before the frosts there were many who believed the Northwest would ship 15,000 cars of apples this season. Just at the present time the amount of damage cannot be definitely determined in some sections, and therefore no definite or very valuable estimate can be given. About the only thing to be said is that the crop will be much smaller than was originally estimated by almost everyone early this year. . . .

The cold rains this season, occurring in some districts during the blossoming time, interfered with pollinization, reducing the size of the crop very materially. The cherry crop, which was in full bloom in many districts during the rainy period, suffered quite a severe loss. The Dalles, Oregon, reports a light cherry crop. Growers in many districts believe the cherry crop of 1916 was largely reduced by the dryness existing during the year 1915. . . .

The Sam Watson is the name of a new cantaloupe being introduced and obtained after many years of experiment by Mr. W. S. Broadeus, a California fruitman.

More Ben Davis apples are grown in the United States than any other variety. Mr. Louis Erb, a commission man of many years in Chicago, and now growing apples in the Ozarks, is the best friend that old Ben ever had. Laying all joking aside, the Ben Davis is considered by many to be a pretty good apple grown in some districts, although the Northwest doesn't stack up on it very heavily. We have eaten Ben Davis in March and April when they did not taste bad, and while we are not fastidious, we do not hesitate to say that any time we can get a Spitzenberg, Winesap, Newtown, Jonathan, Delicious, Grimes Golden, Gravenstein and a few other varieties that the other fellow can have the Ben Davis. . . .

Profesor T. O. Morrison, in charge of the Division of Horticulture, Olympia, Washington, is warning the growers that infected fruit cannot be shipped this year, except to by-product factories, for which a special permit must be obtained. That's business. The less infected fruit growers put on the market the more money fruitgrowers will make. . . .

During the low temperature prevailing in April smudge pots were used extensively in Southern Oregon, it being quite evident that the growers who smudged properly profited largely by preventing the fruit from being affected by frost. The growers who did not smudge suffered more or less.

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
Made Payable to

Better Fruit Publishing Company

E. H. SHEPARD, Editor and Publisher

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In the United States, \$1.00 per year in advance
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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1966, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Crop Statistics for 1916.—1916 was a period of wonderful bloom. A fruit-grower went out through his orchard, viewed the bloom, swelled with pride and imagination, came to town and told the editor of his local newspaper what an immense crop he was going to have. The editor of "Better Fruit" has always been conservative in statistics, and for many years in the past has advocated the advisability of giving no estimates during the blooming period, time and time again,—this year in particular. The value of this advice is evident. Never before in the history of the Northwest, in some sections, has the bloom been heavier or the shedding greater. Frost damages have occurred in many sections, some serious, some not. The June drop has not taken place. Already crop estimates given out from some districts have been recalled on account of frost damage. In other sections the shedding has greatly reduced estimates. The June drop is still ahead. The reports on estimates from other sections of the United States, outside of the Northwest, are not much in evidence further than to say everything is favorable. Therefore "Better Fruit," in accordance with its time-honored custom of giving no estimates during the blooming time, will refrain from commenting on the size of the crop at the present and until such time as the most serious dangers of loss, which occur in the early part of the season, are past, which will be some time after the June drop has taken place. Even then estimates are a problematical matter to some extent, as disease or pests may break out in some districts, dry condition prevail in some others, and other factors arise which may materially reduce the size of the crop, and, on the other hand, favorable conditions may continue increasing the size of the July estimate. "Without a bloom it is a

cinch there will be no crop, with a heavy bloom you may have a heavy crop or a light crop." So don't figure your crop during the blooming period, and, above all, don't give out any estimates, because they do not have sufficient value and may be misleading.

Retail Prices of Apples.—Six years ago the editor of "Better Fruit," accompanied the Experiment Station staff of Pullman, Washington, by invitation, on a tour through the Yakima Valley. In each address at the various places visited, and in numerous addresses given before horticultural societies in other sections of the Northwest in that year and following years, the editor of "Better Fruit" vigorously called the attention of the apple growers to the serious menace of exorbitant retail prices on apples in connection with preventing consumption, showing conclusively that exorbitant retail prices not only prevented consumption, but by so doing lessened the actual price obtained by the fruitgrower. At that time, and for some time afterward, growers failed to realize the seriousness of the situation. It is only recently they have apparently awakened to the importance of this advice. After six years the subject is being taken up by one of the professors, who has given the matter of marketing fruits considerable study, has written an article, which appears elsewhere in this edition. It is well worth reading. Again, the editor of "Better Fruit" says to apple growers of the Northwest: "You must wake up and endeavor to solve the problem. You must find some way of reducing the exorbitant retail prices on apples if you want to get better net returns for your crop."

Advertising and Merchandising Fruit. The subject of advertising, more or less naturally, is one that is very little understood by fruitgrowers. The citrus fruitgrowers understand the value of advertising, so do the raisin growers. Even the loganberry growers, and, by the way, the loganberries are only a drop in the bucket in dollars and cents compared with the apples of the Northwest, have discovered that proper advertising has created a demand, not only for loganberry juice but for loganberry pies, so that the crop has been entirely consumed. Briefly, the loganberry growers unable to move the crop which they had placed in the hands of dealers, by a small fund of \$1,000 only, spent through the advice of an advertising agency, succeeded in cleaning out last year's crop. There is no question about the advantage of advertising. There is no denying the fact that money can be wasted in advertising, but there is one important feature that every fruitgrower should study and understand, that is, advertising without merchandising cannot be expected to accomplish what advertising will accomplish if accompanied by proper merchandising. For instance, it would be foolish to spend a lot of money in Chicago publications and not see that Northwest apples were properly placed

on the market at reasonable prices in attractive form; by that is meant good varieties, good grades, attractive labels and first-class packs. Even with this, if the dealers are not properly supplied and retailers not properly looked after, the maximum benefit cannot be expected to be obtained in accordance with the cost of the advertising.

Automobile Trailers.—An automobile trailer, which can be quickly attached to any automobile, is now being manufactured by several companies, at a very moderate cost. These trailers are being made in different sizes. The editor saw one trailer, having two wheels, which followed exactly in the tracks of the rear wheels of the automobile, which will hold forty crates of strawberries, the price being \$52.50, laid down. Some trailers have four wheels. They are made in various sizes and at various prices. It is our belief that the fruitgrower who has an automobile will find one of these trailers very satisfactory, efficient and economical in hauling his fruit to market. Therefore it seems advisable to suggest that every fruitgrower should inquire about them from his implement dealer. We are sorry to say we do not know what the proportion of tonnage is that can be hauled in proportion to the horsepower of the automobile. However, all this can be obtained from the dealer, who undoubtedly is posted, and if not, can become so, for anyone wanting the information.

The Apple Crop of the Northwest Will Be Clean This Year.—In 1915 the apple growers of the Northwest suffered more from codling moth, fungus and various other pests than for several years in the past. It gives the editor of "Better Fruit" great satisfaction to say this year that growers of the Northwest are spraying more thoroughly, doing their work systematically, sparing no expense and no time in an endeavor to produce a clean crop of fruit. This is indicated by the fact that in some sections the purchase of spray materials is doubled, even trebled, over previous years. It is also further indicated by the fact that in some districts nearly half as many spray outfits were purchased this year as were purchased during the last thirteen years. So the trade can look for a clean crop and high-grade fruit from the Northwest, barring some unforeseen trouble. It may be said in addition to this, that never has the foliage or the quality of fruit looked finer or as free from pests as it does at the time of going to press with the June edition, June 1st, 1916.

Marketing the Crop.—The apple growers of the Northwest, as we all know, have been through a series of experiments. Most of the experiments so far failing to realize a price for apples the grower felt he should receive. Under such circumstances it can be easily understood that the fruitgrower hesitates over any new suggestion or plan, and many will tell you

"they are from Missouri and have to be shown." There is no way of obliterating the old expression which remains true—"A burnt child dreads the fire." Apparently it is evident that the fruit-grower is inclined to take nothing new for granted, but must be absolutely convinced in his own mind before he is willing to enter into anything new or agree to pay any additional cost in connection with marketing. It also seems evident that the fruitgrower must be not only convinced of a few of the principal features in connection with any new program, but he must be absolutely convinced that each and every one of them is for his own interest.

Automobiles.—The fruitgrowers are most extensive purchasers of automobiles, per capita, of any kind of farmers. In the past automobiles have been very high in price, until during the last two or three years, when some automobiles were put out at low prices. A number of the higher-grade machines, with complete equipment are now being manufactured at a very reasonable figure. By that is meant at a price ranging from \$700 to \$1,200. Such machines are complete in equipment, with self-starters, electric lights and practically all of the modern attachments. They are meeting with popular favor. A few illustrations of some of these, with complete equipment at moderate prices, from time to time, will appear in "Better Fruit." It is hoped they will be interesting to the fruitgrowers who are thinking about buying an automobile, as possibly some of the pictures may illustrate an automobile which the fruitgrowers have not seen advertised in any of the publications which they are taking.

Officers and By-Laws of Fruit Growers' Agency, Inc.—In order that the fruitgrowers of the Northwest may be fully informed in connection with the Fruit Growers' Agency, Inc., although a number of articles about this agency have appeared in previous issues of "Better Fruit," showing their scope, the by-laws and a list of officers are published elsewhere in this edition. Anyone wishing information can write any of the officers or members and obtain information. However, it seems wise to suggest that correspondence primarily should be directed to the president, Captain Paul H. Weyrauch, at the present acting secretary, address, Walla Walla, Washington. In order that fruitgrowers may form a personal impression of the splendid character of the head of this institution Captain Paul H. Weyrauch's picture is produced on the outside cover of this edition.

Fire Blight.—Fire blight has not been reported to any extent from any of the districts of the Northwest up to the first of June, but that does not mean it may not break out in the near future. Therefore, again it seems wise to suggest to the fruitgrowers to be on the lookout, following the recommendations given by those who have made a study

of the subject. If you are not posted consult your Horticultural Inspector or Experiment Station, or someone else who knows.

Mr. E. E. Samson of North Yakima, Washington, after an extended trip throughout the East, states that on account of the large crops during the last few years that there is an evident tendency on the part of the dealer and operator to buy less for cold-storage purposes. It is evident it will be very difficult in advance to determine the amount that will go on cold storage during 1916. It is Mr. Samson's opinion that the amount of hail-marked apples, wormy apples and apples affected with various other defects, which were shipped last year, were a serious menace to the industry, and in order to recover from the bad impression created it will be absolutely necessary for the pack to be very high grade this year.

Mr. J. M. Perry of North Yakima believes the excessive amount of apples held on cold storage, which were forced on the market at low prices in order to clean up the 1915 crop, will be a factor in creating an apple-consuming habit, resulting in increased demand during the year 1916.

The apple holdings in storage May 1, 1916, were 92 per cent greater than May 1, 1915. One or two conclusions is evident. Either the holders wanted too much money and held too many or they held too long, expecting higher prices at the end of the season.

Mr. J. A. Westerlund of Southern Oregon is a strong advocate for the Fruit Growers' Agency, Incorporated, and has been doing some very active campaign work in urging the fruit-growers of Southern Oregon to affiliate.

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How to Protect Rose Bushes from Rose Aphids

[U. S. Department of Agriculture, Office of Information]

WHEN new growth starts on the rose bushes in the spring, and throughout the summer and fall, the young growth and the flower buds and stems of rose bushes are often covered with a small green or pinkish plant-louse, known as the rose aphid, which sucks the sap from the tender portion of the plant and causes an unhealthy curled condition of the foliage and disappointment in the number and quality of the flowers produced. The rose aphid passes the winter in the egg stage on the stems and dormant buds of the rose bushes, according to A. D. Hopkins, forest entomologist, United States Department of Agriculture. The insects hatching from these eggs reach maturity in about 15 or 20 days, all being wingless. They are pear-shaped and either bright green or pinkish in color. At this stage they begin to produce living young, each individual in course of about 20 days producing 50 to 100 young, which on maturity are either winged or wingless, and in turn either green or pinkish. Thus the tender growth soon becomes crowded with various sizes, colors and shapes of aphides, and, to insure their progeny with an adequate food supply, the wingless mothers migrate to less crowded growth and the winged ones fly to other rose bushes, each starting a colony for herself. In favorable weather conditions, especially in a humid atmosphere, many generations may thus follow one another, covering every bit of green vegetation on the bush with their bodies, their cast skins, honeydew, and the resulting sooty fungus. It can easily be seen that, had every aphid produced in the course of a season lived its full life, the progeny

of a single over-wintering egg would run into millions. The presence of ants on the rose bushes is an indication that the aphid is present, because the ants collect the honeydew from the aphides and, to a certain extent, protect the aphides from their insect enemies.

As above indicated, the rose aphid thrives best in cloudy, humid, warm atmosphere, hence with the appearance of a hot and dry spell they often disappear as suddenly as they appeared. Aside from a variety of causes, like driving rains, winds, etc., which decimate its numbers considerably, the rose aphid is attacked by other insects, which either devour them or develop from eggs deposited in their bodies.

Ladybirds, lacewing flies, and the larvae of two-winged flies called syrphus flies are among the former, and a number of species of tiny wasp-like insects represent the internal parasites. Sometimes these natural agencies of control are sufficient to keep the aphides so reduced in numbers that they do little or no harm. Notwithstanding the effectiveness of natural checks, however, their intermittent character unfortunately renders their help often too late to save the flower crop. It is always advisable, therefore, to watch rose bushes for aphides and to apply remedies as soon as they are discovered.

Fortunately the rose aphid readily succumbs to artificial methods of control and, with the different styles of spray pumps on the market, there is no excuse for allowing roses to suffer from these insects. The simplest, most commonly used, and often quite effective remedy, is to turn a fine but forceful stream of water on them by means of the garden hose. Applied often enough this gives satisfactory results. Solutions of fish-oil or cheaper grades of soap are often useful as a prompt remedy. The soap is used at the rate of one pound to four gallons of water. To make the solution, shave the soap into the water and dissolve by heating, adding enough water afterward to make up for evaporation. The best remedy for the rose aphid is 40 per cent nicotine sulphate (a liquid which can be purchased in most seed stores), diluted at the rate on 1 part to 1,000 to 2,000 parts of water, with fish-oil soap or laundry soap added at the rate of 1 pound to 50 gallons of the spray mixture. The simplest way to prepare the spray in small quantities and secure satisfactory proportions of the ingredients is to put 1 teaspoonful of the nicotine sulphate in from 1 to 2 gallons of water and then add one-half ounce of laundry soap. One spraying is usually 100 per cent effective, but if the first application has not been thoroughly made, a second one may be necessary.

In order to prevent the possible development of mildew as a result of



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HAGERSTOWN, MARYLAND

frequent spraying it is advisable to make the application in the early morning so that the spray will dry off the plants promptly. The spraying device to use depends on the amount of spraying necessary. A cheap atomizer, such as can be bought in any seed store, is quite satisfactory for small plants and gardens. Good knapsack and barrel pumps are available for commercial growers.

Tree Growth in Blasted Ground

By J. R. Mattern, Julian, Pennsylvania

One in a judicious frame of mind may often wonder, after ten years or more of active propaganda by the Powder Companies for the use of explosives in preparing the ground for trees, just what the average results of such blasting may be. It is certain that literally thousands of planters of fruit trees have made use of the method. In some of the famous fruit sections of America blasting the ground has become the universal, standard practice.

An examination of a good many orchards where the trees are growing in land prepared for them by blasting shows first of all that the trees are anchored more securely. There is far less of that leaning away from the wind that characterizes too many orchards. It not only is unsightly—it often means the breaking down of the trees under their usual loads of fruit. I do not know whether this can be attributed to a deeper root system or to more extensive root systems. Probably it is a combination of both.

I have not observed that in young trees the blasting of the ground results in much thicker growth of trunk, though only a few trees have been measured within my observation to check up this point. But in older trees that are growing in the ground containing hardpan, there is a decided increase in the thickness of the trunks of the trees where the ground has been blasted. Probably the young trees do not yet have vital need of the underlying strata of soil. Probably the trees begin to suffer from the lack of food and lack of water that stunts them and keeps them back only after they have thoroughly worked over the top soil within reach of the roots. In one instance apple trees over hardpan were lifted by the forces of growth till the roots were exposed above the ground, simply because the hard ground beneath offered no opportunity for root penetration.

There probably are a good any soils that will not be benefited much by blasting, particularly if the blasting is not immediately followed in the right way with heavy-rooted cover crops. But these soils do not often occur in the fruit-growing sections, for there are problems in moisture storage and in the making available of insoluble plant foods which the blasting helps to solve, and these problems are present in clay and loam, and highland and lowland alike.

As for length and thickness and number of the twig growth of trees, I

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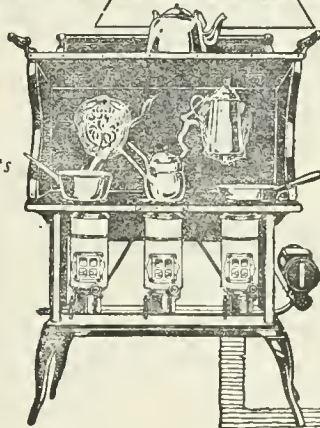


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The Kimball Cultivator

in keeping the ground in perfect condition at a small cost.



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WORKS AND LABORATORY, HOBOKEN, N. J.

personally can bear witness to the fact that in blasted ground there is every reason to expect superiority. In only a half dozen instances out of a hundred that I have seen have the trees failed to make huskier, bigger tops in blasted ground. It is the rule rather than the exception to see whole blocks of one thousand or ten thousand trees so planted show an average growth of eighteen or twenty or twenty-four inches in a season, and alongside of this I reflect that on similar soils I have seen many orchards planted with inferior tillage that would average only seven or eight or ten inches in twig growth in a season. It is only fair to say that I have seen a few orchards in light sandy soil, and in very heavy soil, where blasting apparently did no good, or even did harm. The sandy soil seemed to loose in moisture-holding capacity by the blasting. The clay seemed to hold water around the trees too long.

There may be some question about the value of blasting an open, fertile soil, but there can be no question at all when there is the least indication of plow sole, or hardpan, or a layer of clay. Blasting is intensive tillage. If you believe in tillage you automatically believe in the use of explosives to secure it, because there is no other method so effective, and none that you can use to get the same results, or to get results of a similar nature for so little money.

Care of Winter-Injured Trees

"Your trees showing abnormal fruit drop, lack of foliage and growth should be given the best of care with good soil treatment and by no means torn out," say the horticultural authorities in reply to the flood of inquiries reaching them from men who are seriously concerned over the unfavorable condition of their orchard trees in many parts of the state.

The most serious tree injury appears in young trees from one to eight years of age. These trees also show the characteristic abnormal fruit drop. Of the older trees the difficulty seems to be confined chiefly to the altogether too heavy drop of fruit. "There are thousands of trees that show a condition ranging from a sickly condition to that of seemingly dead," says Professor C. I. Lewis, head of the department. "There are hundreds of thousands of trees that show lack of foliage and proper growth. Indications now are that a large percentage of the pear and prune trees shed their fruit so badly that there cannot be expected a commercial crop. In some cases the drop is so severe that no crop at all is expected. The cherry drop is abnormal in some sections of the state. The apple drop will come later, but it is not yet known whether it will be abnormally severe. Some think this abnormal drop is due to abnormal weather during the blooming period. Experts of the Experiment Station, however, think that the late bad weather had nothing to do with it. The drop was already well under way before the cold

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spell set in. The general weather conditions during the blooming period have been one of the best in the last ten years. There has been some rain during the blooming period, but not prolonged. The frost has been absent entirely or very light. There has been considerable sunshine, the usual amount of warm weather with an even temperature. The unusually favorable conditions are shown by reports of Oregon bee men, who say that the bees have accumulated an unusually large supply of honey.

"The college authorities attribute the drop to weather conditions of January and February. Last winter was one of the hardest on fruit trees in the last twenty years. This weather damaged the trees by loosening and breaking up the cambium layers, sometimes splitting the bark and wood. Attention was called to this condition by the specialists during the latter part of February. It was said at that time that the injury would become very noticeable along later in the season. This condition has now been reached. It was not merely the severe cold as much as the sudden change in temperature that affected the trees unfavorably. On one occasion within three hours the thermometer dropped from sixty to thirty degrees. Such sudden changes must of necessity have damaged the trees. Lack of nutrition first appeared in the buds, which suffer most. This laid the foundation for the present heavy drop of fruit.

"Other evidence that the damage is due to winter injuries is shown by the abnormal condition of the pollen. Also the injury is most severe in regions that have been affected unfavorably by drought during the last one or two years. It is also bad on shallow soils and in orchards suffering from lack of cultivation. These conditions are always apparent in the East, where winter injury is frequent. Although the fruit crop may be exceedingly light, yet it has been shown in the past that trees that shed their fruit abnormally may recover and in time become good trees. Hence the department urges the importance of simply giving good care and treatment to the trees and soil and allowing nature time to work her own recovery."

Mr. R. G. Phillips, secretary of the International Apple Shippers' Association, states that many apples being barreled which should be sent to the evaporator, cannery or cider mill, is a big factor in oversupplying the markets. He is correct. It may be said in addition to the above remark that this class of apples when shipped usually does not pay the freight and are handled at a loss, when a reasonable amount could be realized if they were sent to the evaporator or vinegar factory. Mr. Phillips also states that the off-grade fruit displayed in the grocery stores and fruit stands repel rather than invite consumption. It is not only possible to produce too many apples but it is very easily possible to kill the best apple markets in the world by trying to force inferior grades and varieties on the public.



"Wenatchee" Fruit and Vegetable Picking Bags

(Patented April 27, 1915)

This bag is emptied by releasing a snap. The bag will hold about a bushel. When snapped at the frame it will hold about a half bushel. The frame is made of steel, the canvas is 10-oz. and every point is reinforced with leather where from experience it has been found necessary. **Price \$1.75 post paid** to all parts of the United States where we have no agents.

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OREGON AGRICULTURAL COLLEGE
SCHOOL OF AGRICULTURE AND EXPERIMENT
STATION

Corvallis, May 29, 1916.

Editor Better Fruit:

In the April number of "Better Fruit" on page 14 there was published a short extract in which Professor H. A. Surface of the Pennsylvania Department of Agriculture advised a Pennsylvania fruit grower to spray with Bordeaux and arsenate of lead for Baldwin spot.

Knowing that many growers in the Northwest often apply the name "Baldwin spot" to the common disease usually known as bitter pit, the writer undertook to find out from the plant pathologist of the State of Pennsylvania what sort of disease was referred to in the article mentioned. In reply, information was received showing that the spotting of apples in Pennsylvania for which spraying is effective is not the bitter pit or "Baldwin spot" of the Northwest, but is the *Cylindrosporium* spot, not known to occur in the West.

The bitter pit or "Baldwin spot" of the Northwest is a disease of physiological origin and cannot be controlled by spraying. This disease and related troubles are admirably discussed in the February, 1916, (page 13) number of "Better Fruit" by Dr. Charles Brooks, and the reader is referred to this article for reliable information on the subject.

Very sincerely yours,
H. P. BARSS.

Charges Often Made Against Auctions

"The auction is a dumping ground"—but why are the choicest cherries, oranges, lemons, grape-fruit, pears, plums and pineapples sold at auction.

"Combinations are likely to exist among the buyers"—but why do the

California Fruit Growers' Exchange, The California Fruit Distributors, The Florida Citrus Exchange, and The Mutual Orange Distributors, use exclusively the auction in twelve or more of the largest population centers of the United States, and why do their agents put the lie to the above statement so often made to growers by interested parties.

"The auctions are sporadic and uncertain"—but why do prices on like quality and condition of fruit not vary over ten or fifteen cents at any sale.

"Auction selling is not good merchandising"—but why did the United Fruit Company discard the private salesmen and adopt the auction in New York, Philadelphia and Baltimore.

"The auctions cause gluts"—but why are they used to relieve gluts in the selling of apples whenever the private sales system is clogged.

"The auction selling of apples is new and untried"—but have not the apples been selling at auction in London, Liverpool, Glasgow and Hamburg for years; and did not the Boston auction handle satisfactorily nearly one-half of the ears of box apples sent to that market.

The Truth.

"The fruit auction system is the logical, economical and efficient way of distribution of standardized fruits in large population centers"—so says the Department of Foods and Markets of the State of New York.—No. 5.—Adv.

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Fruit Industry Paraphrased

The New York commissioners will enforce the new federal barrel law during 1916 very vigorously. A law is created because it is believed to be good. This is not always true, but there is no question but what the apple-barrel law is a splendid law for the fruitgrower. If it is enforced in the State of New York and other states it will undoubtedly prevent a lot of cull apples from going on the market, on which the grower usually loses money; and more important than this, these cull apples, which have been marketed for many years in the past, spoil the market by filling it up with unattractive and uninviting fruit, repelling the buyer and unnecessarily overcrowding the market with unsalable stuff. We say to the New York commissioners: "Enforce your laws, and when you do it you will be helping the fruit industry."

Mr. Horace W. Day, of Sgobel & Day, after making a tour of California and the Northwest, reports in an interview given out by the press, published in various newspapers, that the California Bartlett pear crop will not exceed 60 per cent of last year, and that the Medford pear crop suffered severely from frost also. From information obtained, Mr. Day says he understands that Hood River did not suffer from the frost. Mr. Day gives the very interesting statement that deciduous fruits, including pears, will bring much more

money this season than for some years past. Mr. Day, when interviewed in May, stated that the condition of the apple crop was problematical, for the reason that at time he was unable to determine definitely the amount of damage done to the crops in the Northwest. He believes, however, that prices will depend upon two factors largely,—the amount of tonnage and the methods of marketing.

The Columbia Highway between the City of Portland and The Dalles is now open. The roads from The Dalles going east are in good condition for country roads, so that Easterners who want to visit the great Northwest will find it pretty satisfactory going all the way across the continent. The road from Portland to California is also in number one condition. Tourists who have traveled all over the world say there is no roadway anywhere in the world that has scenery anywhere approaching either in grandeur or magnificence that along the Columbia River between the City of Portland and Hood River.

The new fruit standardizing law for the State of California will be operative and effective for the year 1916. This law has been printed in several languages, so that all foreigners engaged in the fruit business in California will be able to read it. It is the intention to carry on a very vigorous enforcement of the law.

Supplies for the fruitgrowers will come high this year. Boxes cost more. Paper costs more. Spray costs more. In fact about everything that goes into the production of a box of apples both in growing and harvesting costs the fruitgrower more money this year. The trade will please take the hint. We need the money. We must live. Everything we have to buy, to eat or wear costs more, therefore the fruitgrower should get more money for his fruit this year, and with the business prosperity existing at the present time, and the severe loss occurring in many fruit section, reducing the quantity, there is every reason why the fruitgrower should be able to secure better prices. Co-operation at this end of the line is all right. The associations are doing good work, but the fruitgrower wants a little co-operation from the fruit dealer, and more particularly from the fruit retailer.

On account of weather conditions and frost the fruit crop of Sacramento Valley has been materially reduced. Among the varieties of fruits suffering severely are apricots, peaches, pears, prunes and grapes. While it is difficult to determine definitely the loss from various sources it may be stated that the loss will be somewhere near 50 per cent.

California reports a very heavy damage from frost and loss on grapes, amounting to \$500,000. In the Sacramento Valley the loss is estimated at 80 per cent; Marysville, 30 to 60 per cent; Florin district, 30 per cent; Lodi, 30 per cent; in Yolo, very little. Marysville section suffered from severe frost, damaging the tomato and potato crops very extensively, the damage covering Yuba, Sutter and Butte Counties.



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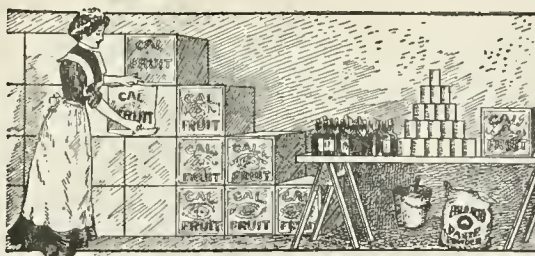
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Enforcement of Our Horticultural Laws

J. W. Pomeroy, Scappoose, Oregon, before State Horticultural Society Meeting at Corvallis

I FEEL especially honored in being invited to speak to your honorable body this morning. I do not wish what I may say to be construed as coming officially from the Board of Horticulture. This would be erroneous. I simply wish to call your attention to some of the work that comes under my jurisdiction, and to conditions as I as an individual see them. One of the great considerations that comes home to every grower of plants or plant products is the necessity of protection against pests and diseases that infest them. In spite of the many different means that may be adopted for the eradication of these pests and diseases and of the many sources of information at our disposal, we find a large portion of people igno-

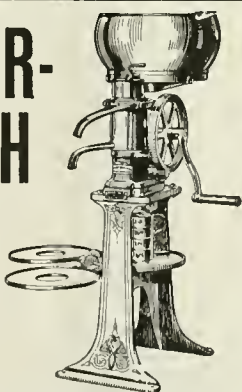
rant of their use and in some cases of their existence, and another portion unwilling to apply that means unless compelled to by law. I want to pause here to remind you that it is necessary that we eradicate these pests and diseases. They must be kept in control if we are to successfully grow plants or plant products. To this end rules and laws adopted from time to time to meet the problem as it has made its appearance, and part of the work of the State Board of Horticulture is to enforce these laws and regulations. Upon my resuming the duties of Commissioner of the State Board of Horticulture, I was firm in the conviction that every orchard in my district would be sprayed at the proper time and that every tree not bringing forth good fruit would be immediately hewn down, and that bug or fungi that played havoc with fruit branch would post haste meet its death or leave for another climate. I was not long in learning, however, that these were the deductions of a fool, and I began to wonder why my dreams of a millenium in that line did not materialize.

I talked with and urged inspectors to action in various counties of my district and became very impatient with some of them because the law had not been enforced in some instances as readily as I had anticipated. It soon became evident to my mind that there were certain localities and districts where law enforcement was an easy task, while in other sections it was next to impossible to get results. It is true we probably would get the conditions remedied partially or in a half-hearted way for one season. This left us the same old routine to go through the next season. As I grappled with this problem, I became more convinced of the truth of what Dean Cordley told me some years ago. He said: "You cannot successfully bring about a reform by force. It must come through a patient and tactful education." I believe this

holds true in any line of action. I can remember when it was impossible to enforce the law against boot-legging in my own home town because the majority of people in that place were not conscious of any wrong in the act. Now, however, as a result of a campaign of education, public sentiment has changed to such a degree that a law-breaker would get six months in jail so quick it would make his head swim. I have, therefore, been brought to this conclusion; that a great part of the problem of horticulture law enforcing lies, not so much with the officials acting as policemen as it does with the growers themselves. I believe the inspector must be more of an advisor and

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H. H. Eastman, Albany, Oregon—"I have used several makes, but I consider the Anker-Holth the most simple and well constructed separator I ever saw."

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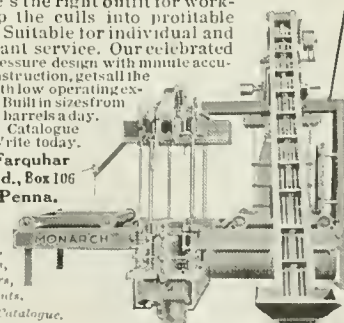
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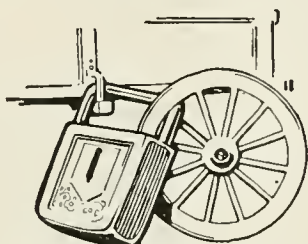
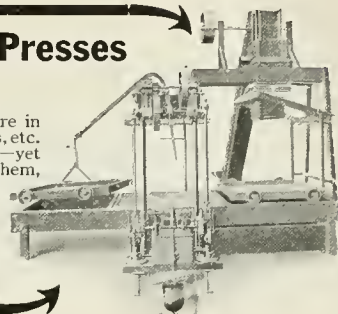


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less a policeman, and must foster and solicit the cooperation of the grower. I find that wherever the sentiment of the majority of growers favors law enforcement we get results that are lasting with no great effort, and these situations prevail only where people can be brought together in some form of organization or meeting, and can be induced to see the actual conditions and its consequence together. In other localities where this cannot be accom-

plished the commissioners have made no particular effort to enforce the law, believing that they are avoiding a course that would entail large expense upon the taxpayers and bring no satisfactory results from the standpoint of the grower.

There has been considerable criticism leveled at the inspectors because of their tendency to be lenient until the desired education could be accomplished that would result in community

effort. It has also been said that our horticultural laws were not sufficient to cope with the problem. But let me pause here to say that our present code of horticultural laws are the result of long and patient constructive effort on the part of our best growers and experts in that line, and I am firm in my belief, with what experience I have had that they are the best code of horticultural laws yet enacted by any state in the union. We have power to intercept or eradicate any disease or pest, and to carry on any rational program for the protection of our great fruit industry, each county having the authority in proportion to its needs for that purpose, and whether or not these laws are enforced depends to very large degree upon the grower himself. In fact, very few serious problems face us that are not directly the result of the lethargy and lack of interest of those growers themselves, who desire protection. For instance, I have a county in mind in my district where the county officials are opposed to allowing any funds whatever for inspection or advice along that line. These officials are not fruit growers and know nothing of the problems of the fruit grower, and they deny the growers the right to claim any part of the county funds for that purpose. Partly for political reasons, and partly because the inspectors did not begin cutting down people's orchards sum-



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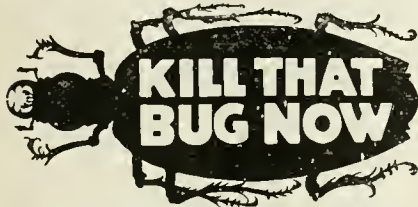
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marily, they were advised that the inspector was not doing his duty. I know that the problems of this county are not the lack of police force, but the lack of practical and expert advice and education. Now, whose fault is this, but that of the growers themselves? All other interests in the county see that their county officials provide for their needs, but the fruit grower has been content to sit and blame the law. In spite of the fact that this is one of the largest fruit-growing counties in my district. What the county needs is a practical and scientific advisor first, and a quarantine officer last. But above all, we want the healthy, wide-awake interest and cooperation of the growers themselves. I wish to say aside here that there has been considerable effort on the part of other states and some in this state to originate and establish uniform horticultural laws. It is difficult, however, for me to see how this visionary solution can be realized with this state as a factor. Oregon occupies a peculiar position in this matter. Portland being one of the principal ports of entry, much traffic does and will enter here from all parts of the world, whose ultimate destination will be many parts of the United States. When we consider the source of these shipments entering here, it must be clear to us all that Oregon can never repeal or change her present quarantine law with regard to her practice of inspecting horticultural imports at point of delivery. In fact, any tampering with this law would undo the work of years. There are probably small changes that could be made each year in our horticultural laws that would simplify and aid conditions, as has been resorted to in the past. But we must keep in mind always the protection of our great and growing plant industry. The impression, however, that I wish to leave with you as I conclude is that we must in our rational enforcement of our horticultural laws have your loyal support and cooperation.

Some New Facts Concerning Fire Blight

Continued from last issue

For a brief statement concerning these leaf lesions and proof that they are caused by *Bacillus amylovorus* I shall quote from my publication, to which I have already referred: "In the majority of cases the leaf infections start at the margin and are either lateral or terminal, although central lesions have been found in some cases on apple leaves. The lesions on the apple leaves are a light brown or yellowish brown and frequently show a faint purplish border at the advancing edge. In active lesions the advancing edge shows a narrow watery zone. Those on pear leaves are darker in color and exhibit a mottling of various shades of dirty brown. There is a noticeable tendency for the bacteria to advance more rapidly down the midrib or certain lateral veins, so that many young lesions are more or less triangu-

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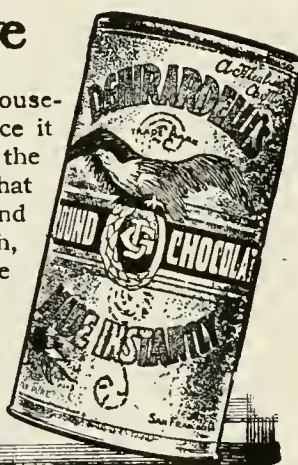
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lar in outline. In some cases the migration of the bacteria can be noticed along certain veins in advance of the general border of the dead area. All stages of leaf invasions have been found from slight marginal infections to lesions which have advanced throughout the entire leaf blade and down the petiole. These leaf infections were not rare, but it was possible to find dozens of them on a single five-year-old tree. The writer is of the opinion that the bacteria enter the intercellular spaces through the water-pores and also by the stomata to some extent, and later penetrate the vessels in the way suggested by Bachmann. It remains for further investigation to definitely substantiate this view. It is

an easy matter to verify the presence of the bacteria by microscopic examination. Dissections made from the advancing edge of a lesion give the organism in large number, and if the tissue selected includes one of the larger veins they can be seen to ooze out from the broken ends of the vessels. A sufficient number of lesions have been examined to leave no doubt as to the constant presence of the bacteria. The lesions have also been tested by cultures for the presence of living bacteria. Mr. H. W. Samson, Horticultural Inspector at Spokane, assisted in collecting material and also sent fresh specimens to our laboratory for use. It was at his solicitation that the writer first visited Spokane to make field

observations. In many of the isolations tried the bacteria were found to be dead, but pure cultures were obtained from others by the poured-plate method. Since the study of these leaf lesions was not begun until July, this condition is what one would expect, as at this time of the year the bacteria are dead in a good per cent of the twig infections. In some cases where microscopic examination showed an abundance of bacteria, the cultures showed that only a relatively small per cent were alive. It seems probable that a certain per cent of the leaf lesions will behave like the twig lesions, and the bacteria become active in them after the return of more favorable conditions. The pure cultures isolated from the leaf lesions have been used for making inoculations into seedling apple trees. The trees to be inoculated were placed in the inoculation chamber and kept well watered for 48 hours previous to introducing the bacteria into the tips just back of the terminal bud. The inoculations were made July 31st, and by August 8th the seedling exhibited fire blight in severe and typical form. The microscopic examinations

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and the results from inoculations leave no doubt that the leaf lesions described above were due to *Bacillus amylovorus*."

The important new fact is the definite establishment of the occurrence of leaf lesions, so we must now add this as one of the known ways in which fire blight manifests itself. This will not bring a message of cheer to those who are engaged in the fight with this disease. Even with the most careful removal of cankers and twig blight infected leaves may be left behind. The removal of all of these infected leaves would be out of the question. Possibly many cases of reappearance of blight after careful cutting may be due to the bacteria which have persisted in these infected leaves. Two very important questions concerning these leaf infections remain for further investigation. Do leaf infections take place through the stomata and water-pores or are insect punctures or other wounds necessary? While the evidence is in favor of an independent entrance of the organisms through the epidermis, the proof is still lacking. To what extent do the bacteria advance down the leaf petiole and into the twig, thus causing twig blight? That they do this to some extent seems certain, but the frequency of this behavior is of importance. It is hoped that the work of another season will give new light on these points and I trust we may have the benefit of observations made by fruitgrowers in various portions of the state.

Where the Names Come From

Cherries were introduced into Europe 70 B. C., by Lucullus from Kerasunt in the Black Sea.

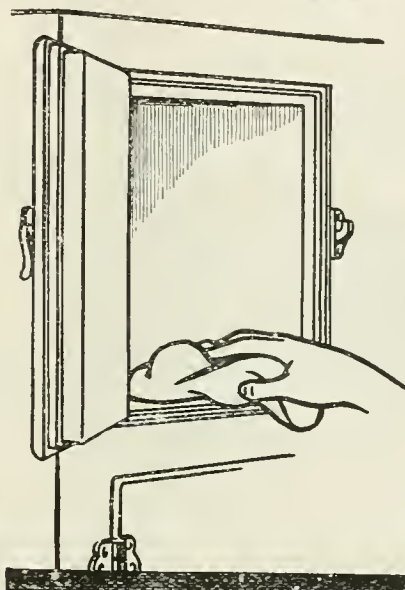
Damson Plums originated at and were named after Damascus.

Gooseberries are called in Germany Johannis-beeren or Johns berries, because they ripen about the feast of St. John. St. John is called in Holland St. Jan, and the fruit there is called Jans-beeren, which long ago was corrupted into Gansbeeren, the literal translation into English being gooseberry, as Gans in German signified goose.

Greengage Plums originated near a monastery in France near Fontainbleu. Scions were taken by the Rev. John Gage to his brother, Sir Thomas Gage, who had them grafted on trees in the

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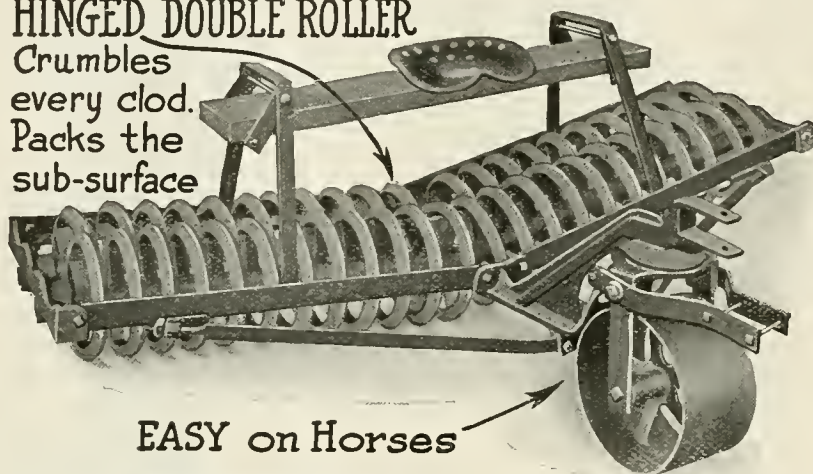
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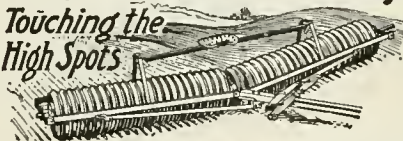
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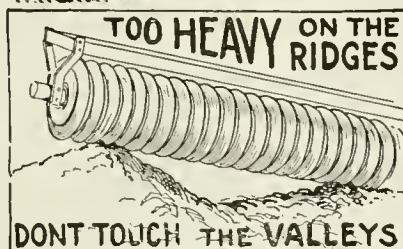
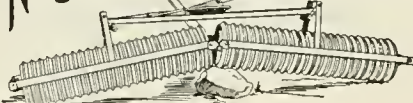


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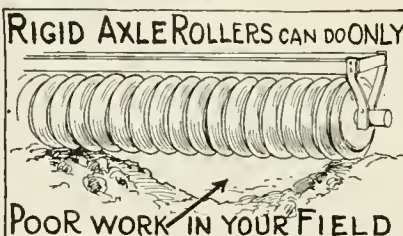
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garden at Hengrave in England, from whence they spread rapidly over Europe.

The Walnut is a corruption of Gaulnut, the nut of Gaul or France, as Galilea and Wallia both anciently signified Gaul. The transition from Gaul-nut to walnut was easy.

Marmalade originally meant a jam made from the quince, and originated in Portugal, the name being derived from the Portuguese word marmelo or quince, the jam being called marmalade. The word is now used for jams made from oranges, apricots, plums and other fruits.

Muscat Grapes are not as generally supposed names from the musky flavor of this variety but on account of the grapes attracting flies (muscal).

Oranges—The sweet orange was first brought from China to Europe by the Portuguese in 1549. The original tree was said to be alive a few years ago in Lisbon.

Orchard is from the Anglo-Saxon word orlgard or wortgard, a yard or garden, where worts or vegetables were grown.

Pippin—The name pippin applied to an apple originally signifying that the variety was raised from the seed or pip. The prefix usually refers to the location where originated or the name of the originator.

Raspberry is a contraction of Raspiberry. An old name for the raspberry was Hindberry—German Gimbeere. The bilberry was called Hartberry, Anglo-Saxon Heoribeorg, from the stag or hart, and the raspberry was called hindberry from the female of the same species.

The Strawberry was probably originally Strayberry, and was named from the runners which stray from the parent plant, establishing themselves independently.

Vinegar is from the French Vin-aigre or sour wine.

Advertise—The original meaning of the word was admonish, used by Ben Jonson in this sense: "Let me advertise you," meaning "let me admonish you." The accent was on the second syllable. The first advertisement ever published appeared in a newspaper entitled "Perfect Occurrences of every daie journal in Parliament and other Moderate Intelligence No. 13," from Fryday March the 26th to Fryday April 2nd, 1647. The advertisement related to a book called "The Divine Light of the Church," London.

Apples were first cultivated in America in 1629, having been imported from England by the Governor of Massachusetts. Governors Island, Boston Harbor, was given to Governor Winthrop in 1632, on condition that he should plant an orchard on it.

Apricot—Formerly apricoek, is from the Latin praecoqua, the name given on account of the fruit ripening before peaches. The apricot is a native of Armenia, being introduced in Europe in the time of Alexander the Great. It was first grown in England about the middle of the sixteenth century.

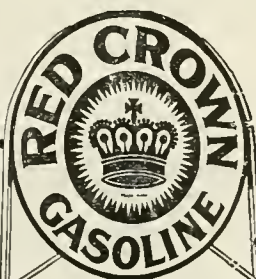
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Separator gets all the cream because it automatically regulates the inflow exactly in proportion to the separating force—always just right for perfect skimming.

The Suction-feed Separator delivers smooth cream of *even thickness* that churns out more butter of choicest quality. If you sell cream you can *guarantee uniform density*.

You can increase the capacity of the Suction-feed by simply turning faster, and get through quicker if in a hurry. The new Sharples is the only Separator that can be hastened. You can easily pour milk from a forty-quart can into the low supply can. It's the largest found on any separator—and it's only knee-high.

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The new Sharples is ruggedly built for hard service. It is neat, compact, runs easily and oils itself.

This wonderful machine will earn you a new dairy profit—without added expense. Our new free book, “*Velvet*” for *Dairymen*, fully describes the Suction-feed. Your copy is ready. Send for it today. Address Dept. 99.

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How we build it for half what it would have cost, even in 1910.

How we build it for 20 per cent less than other factories can build it now.

And how, by these savings, we give you 26 extras which you don't find in other cars.

John W. Bate The Efficiency Expert

In 1903—when Mitchell cars were first built—we brought John W. Bate to Racine. He was even then the greatest expert in factory efficiency in the metal working line.

Our vehicle factory was then 70 years old. It was a model efficiency plant. And we started then to make our motor car plant the most efficient of its kind in America.

10,000 Costs Reduced

In the 13 years since, Mr. Bate has reduced more than 10,000 motor car costs.

He built this whole plant—covering 45 acres—so cars could come through without the loss of a second. He equipped it with 2092 labor-saving machines—the most efficient machines that are known in this industry.

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Some motor car makers buy all their parts. Most makers buy the larger share. But 98 per cent of this Mitchell car is built in this model plant. Thus we save under others from 20 to 40 per cent.

Part of this saving is shown in our price. No other high-grade Six of the Mitchell size sells at the Mitchell price.

The rest of the saving pays for 26 extras. We give you 26 features which others don't offer. No car in our class has more than two of them. No car at any price has more than four.

Go see these extra features. You will want every one of them. And you will not, we think, buy a car which omits them.

257 Cars in One

This New Mitchell model came out April 15—from four to eight months later than other current models.

This model was completed after the New York Show. There our experts and designers examined 257 new models. And they picked out the best of the new styles in all of them—from ours and from others—in body design and equipment.

Thus the New Mitchell combines all the best things brought out at the New York Show. Its lines and its luxuries—its new ideas in equipment—are the finest shown. All this in addition to the 26 unique features which other cars don't offer.

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In ease of riding the Mitchell car stands first. Any Mitchell dealer can prove that in five minutes. No other car in the world contains the Bate cantilever springs.

The Mitchell rides the roughest roads as a boat rides waves. This comfort will astound you.

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The Mitchell is the easiest car to drive. That's because of its oversize steering parts, fitted with ball bearings.

The Mitchell is long and roomy—127-inch wheelbase. It is powerful. In every way it gives greater value than other Sixes, because of our factory economies. And it includes 26 features—all costly and important—which other cars don't offer.

Let the nearest Mitchell dealer show these extras to you. He has this new model now. If you don't know him, ask us for his name.

Six-cylinder, high-power, high-speed motor—127-inch wheelbase. Anti-skid tires on rear. Complete modern equipment, including motor-driven tire pump.

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